THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

THE UNITED REPUBLIC OF TANZANIA	WAMI/RUVU BASIN WATER BOARD

IMPROVED DETAILED PROJECT BRIEF FOR PROPOSED BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MVUHA MICRO-CATCHMENT AT DALLA VILLAGE, MVUHA WARD IN MOROGORO DISTRICT, MOROGORO REGION

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SUBMISSION DATE

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Declaration

This Environmental Impact Assessment for proposed boreholes drilling and construction of water supply systems in Mvuha micro-catchments at Dalla Village, Mvuha Ward in Morogoro District, Morogoro Region has been prepared and structured in accordance to Regulation 52(1), (2), (3) and (4) of the Environmental Management (Environmental Impact Assessment and Audit) Regulations of 2005 as amended in 2018. The following Experts prepared this Environmental Impact Assessment Report.

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Executive Summary

1. Title and location of the project

Environmental Impact Assessment for proposed boreholes drilling and construction of water supply systems in Mvuha micro-catchments at Dalla Village, Mvuha Ward in Morogoro District, Morogoro Region

2. Proponent Information

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4. Background information

The Government of Tanzania (GoT), in collaboration with Development Partners (DPs), has been implementing the Water Sector Development Programme (WSDP 2006- 2025). This Programme focuses on prioritized water resources management and service delivery in the water and sanitation sector. Ministry of Water (MoW) is the implementing institution on behalf of the Government of the United Republic of Tanzania.

The second phase of the programme (WSDP II) began in July 2016 with the intention to operate for five years in all Local Government Authorities, Sector Ministries, Basin Water Boards and Water Supply and Sanitation Authorities in the country. The Programme Development Objective is to strengthen sector institutional for integrated water resources management and improve water supply and sanitation services. In addition, the WSDP II is implemented in Water Resources Management to ensure availability of water for socio-economic development and environmental sustainability, in Rural Water Supply to provide improved quality and quantity of drinking water for the rural population; in Urban Water Supply and Sanitation to improve and sustain quality and quantity of water supply and sanitation services for urban populations; in Sanitation and Hygiene to provide access to improved sanitation and hygiene facilities to the population in Rural and Urban settings and in Programme Management and Delivery Support to provide facilitative services that support all other components to deliver planned outputs and expected outcomes.

The entire country is divided into nine (9) main water basins of which the Wami Ruvu Basin Water Board (WRBWB) is among them and it is one of the Basin Water Board which is the implementing Agency (IA) of the second phase of Water Sector Development Programme (WSDPII). The Wami/Ruvu Basin Water Board was established in July 2002 in accordance with law no. 11 of 2009. Wami/Ruvu basin water board has three offices, having its headquarters in Morogoro town and small offices in

Dodoma and Dar es Salaam. The basin includes parts of the regions of Dodoma, Manyara, Morogoro, Coastal, Tanga and the entire region of Dar es Salaam, with a total of 22 districts in those regions. The basin is estimated to have 66,820 square kilometers while the area of the Wami River has 43,946 square kilometers and the area of the Ruvu River has 18,078 square kilometers and the area of the valley of the rivers Mpiji, Mlalakuwa, Misimbazi, Kizinga, Mzinga and Mbezi has 4,796 square kilometres.

5. Brief description of the project

The Wami/Ruvu Basin Water Board (WRBWB) which is under the Ministry of Water through the Government of the United Republic of Tanzania received proceeds of credit from the International Development Agency (IDA) of the World Bank Group to implement the Water Sector Development Project Phase II (WSDP II) from 2017-2022. The IDA support of WSDP has two objectives of improving Integrated Water Resources Management (IWRM) in the country and increasing access to Water Supply and Sanitation services in Dar es Salaam. The project has four components namely Integrated Water Resources Management (IWRM); Dar es Salaam Water Supply Improvement; Dar es Salaam Sanitation Improvement and; Project Management and Implementation Support.

The WRBWB set aside some of credit funds for conducting hydrogeological and geophysical survey in Mvuha micro catchment in Morogoro District, Morogoro region. The survey identified potential site for drilling of boreholes that will provide sustainable water supply for livestock at Dalla Village, Mvuha Ward in Morogoro District, Morogoro Region. One borehole, one cattle trough, one storage tank and one DP will be constructed. Drilling of borehole and cattle trough construction in the above-mentioned village, aims at providing an alternative water supply for livestock in order to minimize their direct access to the rivers so as to conserve the catchments as per the main objective of Sub-component 1.3 of WSSP II; the activity will reduce bank erosion, siltation and pollution in the Ruvu River. The project components will be built within the land area of about 4900 m^2 (70mx70m).

6. Relevant policies and Legislation

The study team reviewed existing policies, laws and accompanying regulations related to the proposed project and general environmental management in Tanzania. The principal legislation controlling the ESIA process are the Environmental Management Act (EMA) No. 20 of 2004 (Cap. 191) and its Regulation, the Environmental Impact Assessment and Audit Regulations of 2005, amended in 2018. The relevant sectoral policies and law include: Environmental Management Act, Cap 191 (2004), The Environment Impact Assessment and Audit Regulations, (2005), The National Investment Promotion Policy (1996), The National Energy Policy (URT 2015), National Environmental Policy (1997), The Land Use Planning Act, No.6 (2007), The Urban Planning Act, No. 8 (2007), Occupational Health and Safety Act, (2003), The Local Government (Urban Authority) Act, (2002), National Policy on HIV/AIDS (2001), The Employment and Labour Relations Act, No.6 (2004), The Water Resources Management Act No. 11 (2009), The Engineers Registration Amendment Act No. 24 (2007), The Contractors Registration Amendment Act No. 15 (2008) etc.

7. Project Stakeholders and their Involvement in the EIA Process

The ESIA team prepared for stakeholders' engagement (SE) prior to the actual site visit. They prepared a stakeholders' engagement plan in which they identified individuals, organizations, governmental institution, and indigenous group from various government administrative levels. The team outlined

the environmental and social entities that could be impacted by the Water Sector Development Programme Phase II (WSDP II) project to be considered during the activities such as land use, vegetation, crops, livestock etc. that will be affected by the scope of the project. TANROADS, TARURA, TANESCO, RUWASA, FIRE AND RESCUE FORCES, WRBWB, Morogoro District Council, Wards and village committees, and community groups just to mention a few are among others, the identified stakeholders for consultation.

8. Result of stakeholder's consultation

Generally, all consulted stakeholders had no objections regarding the proposed project appeared to be content with its objectives leading to its initiation. They all urged the project to abide to the relevant rules and regulations guiding her to all phase of implementations.

9. Assessment of Impacts and Identification of alternatives

The issues of concern analyzed by EIA team as well as raised by various stakeholders have been presented in the Environmental Impact Statement. Overall positive and negative Impacts of the project listed as follows are:

10. Positive Identified Impact and its Mitigation

i. Saving for accessing water time, for pastoralists and people especially for women, who are the primary water fetchers

To mitigate that

- Wami water basin shall ensure the project is implemented in required good standard for live longer
- Ensure the contractor construct the project at the specified design period so to starting saving the community

ii. Reducing conflicts between pastoralists and farmers in the project villages

To mitigate that

- Developer should see how to select the project area especial for cattle trophy far from farmers
- To implement the project under the design period so the conflict ongoing current to be eliminated

iii. Greater accessibility to safe and clean water for livestock and people

To mitigate that

- All drilled borehole shall require (water quality) physical ,chemical and biological checking out in the laboratory
- Monitory of borehole and water scheme network
- Developer should prevent any other human activities to be conducted near the water source which may result to underground water pollution.

iv. Employment generation

To mitigate that

- Developer/Wami water basin shall make sure contractor employee the worker from respective village for those work that does not need professional

v. Water resources protection

To mitigate that

- Wami water basin has required to provide training to respective village as to stop destroy the surface water like river by cattle.

Negative Identified Impact and its Mitigation

i. Soil erosion and sediments transfer

To mitigate that

- Developer has role to ensure the clearance of the project area is done to only used space to reduce bare area
- Construction equipment should be monitored to specific area so that to reduce soil separation which will be blow easily by wind or water

ii. Safety and health risks of workers and nearby streets/villagers (incident and accident)

To mitigate that

- All workers should wear protection personal equipment during all phase
- As area be remote driving should be safe driving by consider the speed limit
- Developer should provide awareness to the workers and village on the proposed project
- Developer should ensure that contractor has first aid kit/s in the working area
- The proposed project should have the full-time safety officer

iii. Loss of vegetation due to site clearance

To mitigate that

- Clearance of site should be done in the developed area such as were drilled borehole, constructed water scheme or cattle trophy
- Re-vegetation to compensate the vegetation ;loss

iv. Noise, vibration and air pollution during construction phase

To mitigate that

- Developer should ensure contractors has services and maintenance their equipment
- To workers working in the high noise and dust or gaseous should be provided with personal protect equipment

v. Spread of HIV/AIDs

To mitigate that

- Mega awareness campaigns on HIV/AIDS and other STDS should periodically be organized
- There is need for continuous sensitization of the workers and community members about HIV/AIDS and other STDs.
- Posters should be displayed on the project site with local language on the precaution measures of HIV/AIDS/STDs

vi. Gender Based Violence (GBV)

To mitigate that

- Developer should ensure that contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including:
- Provision of equal opportunities to all workers

11. Environmental and Social Management Plan

The Environmental and Social Management plan has been structured with the aim of managing the identified impacts and the proposed mitigation measures. The presentation of ESMP is based on three phases of the project. The assessment followed specific procedures and guidelines set by the Environmental Management (Environmental Impact Assessment and Audit) Regulations of 2005 and its amendments of 2018.

12. Environmental and Social Monitoring Plan

Monitoring normally will begin at the start of the project and throughout the life of the project. Its purpose is to establish benchmarks so that the nature and magnitude of anticipated environmental and social impacts are continually assessed. Therefore, monitoring will involve the continuous or periodic review of mitigation activities to determine their effectiveness. Consequently, trends in environmental degradation or recovery can be established and previously unforeseen impacts can be identified and dealt with during the project life. The monitoring plan in this report specifies the type of monitoring; who will carry out monitoring and what other inputs such as training are necessary.
The objectives of Environmental monitoring program are:

- To monitor the effective implementation during the implementation phases of proposed mitigation measures;
- To confirm compliance with environmental, social and safety legislation/regulations during construction;
- To control the risks and ecological/social impacts;
- To ensure best practices management as a commitment for continuous improvement in environmental and social performance;
- To provide environmental information to community/stakeholders;
- To provide early warning signals on potential environmental degradation for appropriate actions to be taken so as to prevent or minimize environmental consequences.

13. Cost Benefit Analysis

The EIS presents an assessment of the project, in terms of negative impacts, compared to the socio-economic benefits that will not happen if the project is not implemented. Environmental cost benefit analysis is assessed in terms of the negative versus positive impacts. The potential benefits of the project, in terms of financial and social benefit are substantial. Similarly, the environmental impacts can be reasonably mitigated and the financial resources needed to mitigate negative impacts, when compared to the required investment, are relatively small.

14. Decommissioning

A preliminary decommissioning plan has been developed. The life span of the project is expected to be 20 years. This is a preliminary decommissioning plan. It establishes feasible decommissioning schemes that can be accomplished without undue risk to the health and safety of the public, decommissioning personnel, without adverse effects on the environment, and within established

guidelines and limits of the appropriate regulatory agencies. This preliminary decommissioning plan will serve the purpose of ensuring that the decommissioning and ultimate disposition of a project is considered during the initial design project.

15. Recommendation and Conclusion

Based on the environmental and social impact assessment carried out for the proposed project, the general assessment indicates no significant negative impacts on environmental and social provided that the recommended mitigation measures will be adequately and timely implemented. The EIA team is of the opinion that key impacts identified can be mitigated with available technologies, competent personnel and commitment of little resources in terms of finances from the project proponent.

Acknowledgement

The Wami/Ruvu Basin Water Board (WRBWB) wishes to acknowledge the following for their invaluable contribution to the success of this EIA study:

- **The National Environmental Management Council** for reviewing project brief. This has enabled the consultant to address all pertinent issues that would have been forgotten.
- **Peter Helpeter Luena** and his team for carrying out this ESIA study.
- All stakeholders as listed in the list of stakeholders are also acknowledged for their invaluable comments, information and data.

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Abbreviations and Acronyms

DC	District Council
DP	Domestic Point Domestic Point
LO	Land Officer
DEMO	District Environmental Management Officer
SLO	Senior Livestock Officer
EMA	Environmental Management Act
DLO	District Law Officer
GoT	Government of the United Republic of Tanzania
GPS:	Global Positioning System
L/Cap/d	Litres per Capita per day
L/s:	Litres per Second
NEMC	National Environment Management Council
PM	Project Manager
ToR	Terms of Reference
WRBWO	Wami/Ruvu Basin Water Officer
WRMA	Water Resources Management Act
WRMD	Water Resources Management and Development
WRBWB	Wami/Ruvu Basin Water Board
WSDP	Water Sector Development Program

CHAPTER ONE

1.0 Introduction

1.1 Background

The Government of Tanzania (GoT), in collaboration with Development Partners (DPs), has been implementing the Water Sector Development Programme (WSDP 2006- 2025). This Programme focuses on prioritized water resources management and service delivery in the water and sanitation sector. Ministry of Water (MoW) is the implementing institution on behalf of the Government of the United Republic of Tanzania.

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The entire country is divided into nine (9) main water basins of which the Wami Ruvu Basin Water Board (WRBWB) is among them and it is one of the Basin Water Board which is the implementing Agency (IA) of the second phase of Water Sector Development Programme (WSDPII). The Wami/Ruvu Basin Water Board was established in July 2002 in accordance with law no. 11 of 2009. Wami/Ruvu basin water board has three offices, having its headquarters in Morogoro town and small offices in Dodoma and Dar es Salaam. The basin includes parts of the regions of Dodoma, Manyara, Morogoro, Coastal, Tanga and the entire region of Dar es Salaam, with a total of 22 districts in those regions. The basin is estimated to have 66,820 square kilometers while the area of the Wami River has 43,946 square kilometers and the area of the Ruvu River has 18,078 square kilometers and the area of the valley of the rivers Mpiji, Mlalakuwa, Misimbazi, Kizinga, Mzinga and Mbezi has 4,796 square kilometres.

The WRBWB set aside some of credit funds for conducting hydrogeological and geophysical survey in Mvuha micro catchments in Morogoro District, Morogoro Region. The survey identified three (3) potential sites for drilling of boreholes that will provide sustainable water supply for livestock in Dalla Village, Mvuha Ward in Morogoro District, Morogoro Region. To each village the drilling of one borehole, one cattle trough, one storage tank, pump house and one DP will be constructed.

Drilling of boreholes and cattle trough construction in the above-mentioned villages, aims at providing an alternative water supply for livestock in order to minimize their direct access to the rivers so as to conserve the catchments as per the main objective of Sub-component 1.3 of WSSP II; the activity will reduce bank erosion, siltation and pollution in the Ruvu River. The project components will be built within the land area of about 4900m^2 (70m x 70m).

1.2 Requirement for EIA

The scoping exercise has been conducted in accordance with the requirements of the Environment Management Act (Cap 191) of 2004 and Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 and shall be read as one with the Environment Impact Assessment and Audit Regulations, 2005 of Tanzania, with full cognizance on World Bank's Environmental and Social Standards (ESSs). Based on the third schedule of the EIA and Audit regulations of 2005 as amended in 2018, first schedule (made under regulation 5(1) the proposed project falls under the category of projects which are mandatory to environmental impact assessment to be carried out. Therefore, proponent is required to register the project with NEMC and conduct EIA in compliant with Environmental Management Act (Cap 191).

1.3 EIA objectives

The ESIA study aims to ensure that the EIA Process is participatory and all possible environmental and social impacts are identified and assessed with appropriate mitigation and monitoring measures proposed. It is designed to help Wami/Ruvu Basin Water Board and LGAs manage the risks and impacts of the proposed project, and improve their environmental and social performance, through a risk and outcomes-based approach. Thus, the objectives of the study are to:

i. Identify the key stakeholders who will be influenced negatively or favorably by the project;
ii. Identify key stakeholder issues about the project (by informed stakeholder consultation);
iii. Describe the intended Project activities and alternatives studied thus far;
iv. Describe the current social, cultural, economic, and environmental circumstances in the Project region;
v. Identify the potential impacts that may affect the existing environment, to ensure that social and environmental considerations are explicitly addressed and incorporated into the Project design and implementation process;
vi. Identify a range of appropriate mitigation measures to avoid or minimize the potential impacts of the Project and to enhance the beneficial outcomes of the Project for the communities within the Project area;
vii. Identify a range of monitoring measures to ensure the mitigation measures are implemented effectively;
viii. Assess other Project alternatives and the justification for implementing the proposed project; and
ix. Identify preliminary impacts which could arise from the proposed Project.

This ESIA study was done in compliance with the (Environmental Management Act (EMA), 2004) and the Environmental Impact Assessment and Audit Regulations, 2005 as amended in 2018. While ensuring that all relevant National and World Bank's environmental and social requirements are adhered to address the risks and impacts of the project.

1.4 Scope of the study

The main scope of this ESIA study was to examine the potential environmental and social impacts of the proposed construction of water supply systems which includes, one borehole drilling, one storage tank construction, one cattle trough construction and one Domestic point construction in each project site. The study's goal was to evaluate the potential effects of the water supply project's construction and operation on the surrounding environment, local populations, and socioeconomic factors. In

order to assure the project's sustainability and compliance with environmental legislation and standards, the EIA research undertook this analysis with the goal of identifying and analyzing both positive and negative impacts, suggesting appropriate mitigation methods, and developing management and monitoring strategies.

1.5 Methodology

The approach used incorporates both qualitative and quantitative procedures in the collecting of data, including: field measurements, site visits, focus groups discussions, interviews, reviews of prior data, consultation meetings, and field observation. The methodology employed in conducting the study is in line with the Environmental Management (Environment Impact Assessment and Audit) Regulations, 2005 as amended in 2018. To carry out the needed resource evaluation, creation of baseline data, identification of potential consequences, and proposal of mitigation strategies, a multidisciplinary team of experienced environmentalists and social experts was created. The environmental team members and other project specialists used a participatory approach.

1.5.1 Literature Review

Review of relevant literature was undertaken during initial preparations and continued throughout the preparation of this study. This helped in the identification of areas where further information would be needed in order to focus the preparation of the ESIA report, and identification of stakeholders and pertinent issues related to the proposed project.

The following documents were reviewed:

- National policies, laws, regulations, standards and guidelines;
- World Bank's Environmental and Social Framework (2018); and
- Background literature of the relevant environmental and social conditions of the participating district councils (DCs) of Morogoro district.

1.5.2 Site Visits and Inspections

Site visits and inspections were conducted to assess the type of stakeholders to be involved for each sub-project. It provided an opportunity to realize the uniqueness of stakeholders within basin section so as to reduce their likelihood of facing challenges during the project implementation. Site visits also aimed at witnessing existing environmental and social conditions of all sections within the Basin as well as likely impacts for each anticipated activity within each section. Inherently, this prompted and allowed for preliminary simultaneous interviews/discussions with some key stakeholders like local leaders/ community members and any other stakeholders that will be directly affected by the project.

1.5.3 Data Collection

Primary field data collection and secondary information were employed in the ESIA study methodology. Physical observation, interviews, and meetings were used to gather information. The observation of natural environmental and social features such as landscape, plants, soils, and so on is referred to as physical observation.

1.5.4 Stakeholders engagement and Consultations

The Stakeholders Engagement (SE) approach is aimed at ensuring that the Project is in compliant with the National requirements listed in section 89 of the Environmental Management Act (EMA, 2004) and Regulation 17 of the Environmental Impact Assessment and Audit Regulations, 2005. Meetings

and interviews with important stakeholders, including community leaders and local residents, were held at the village, ward, district, and regional levels. Interviews and meetings gave a chance to learn about the project and communicate key information with stakeholders. The consultation procedure is detailed in Chapter five (5).

1.5.5 Assumptions of the Study

- The study assumes that the respondents gave trustworthy information on the implementation of the proposed sub-project;
- It also assumes that the project contractor would strictly adhere to the ESMP.

1.6 Report Structure

This report is organized in twelve chapters as described below;

- **Chapter 1: Introduction**

This chapter provides the general overview of the project including how the project background and justification, objectives and scope of the study and methodology used for conducting the study.

- **Chapter 2: Project Description**

This chapter details the project components and further outlines activities and materials used in all phases of the project i.e. (mobilization, construction and operation and decommissioning).

- **Chapter 3: Policy, Legal & Institutional Framework**

This chapter provides details of important policies, acts and regulations that govern the project.

- **Chapter 4: Baseline Environmental and Social Conditions**

This chapter elaborates the project influence area and boundaries. It also describes the baseline / existing conditions of the study area.

- **Chapter 5: Stakeholders Identification and Analysis**

Chapter five explains how the stakeholders were involved during the EIA process and presents their views regarding the project.

- **Chapter 6: Identification and Assessment of Impacts and Project Alternatives Identification**

This chapter discusses environmental and social impacts associated with the project analyzed according to impacts significance as well as alternative projects that are more suitable to the proposed one while serving the same purpose.

- **Chapter 7: Impact Mitigation Measures**

Mitigation measures are summarized in response to the adverse impacts identified in chapter 6 of the report.

- **Chapter 8: Environmental & Social Management Plan**

The Environmental and Social Management Plan (ESMP) presents how the identified impacts during all project phases will be managed to avoid, minimize or offset any adverse significant impacts of the proposed development.

- **Chapter 9: Environmental and Social Monitoring Plan**

Environmental and Social Monitoring Plan elaborates how the implementation of the ESMP will be monitored throughout the phases of the project. It is a plan to monitor the efficiency of the proposed project mitigation measures.

- **Chapter 10: Cost Benefit Analysis**

In this chapter, the Environmental cost benefit analysis is assessed in terms of the negative versus positive impacts. The potential benefits of the project, in terms of financial and social benefit are substantial.

- **Chapter 11 Decommissioning**

This chapter presents the activities involved when the proposed project is no longer operational and potential impacts to be managed.

- **Chapter 12: Summary and Conclusions**

Summary and conclusion summarize findings concerning how feasible, viable and environmentally acceptable the project is and provides recommendations to the proponent on the feasibility of the project. In addition, the report presents references and appendices that are attached herein.

CHAPTER TWO

2.0 Project Background and Description

2.1 Overview

This section of the report presents stage-by-stage description of the proposed subproject's components, activities and logistics. As for this time, it is expected that activities for the project shall be carried out in four (4) stages i.e. Designing/Planning, Construction, Operation and Decommissioning. Description of the various project components is provided in the subsequent sections.

2.2 Location, Accessibility and Adjacent Land Use of the Project Area

2.2.1 Project Location

The project is located at Dalla village in Mvuha Ward of Morogoro district in Morogoro region. The district is bordered by Bagamoyo and Kisarawe districts (Coast region) to the east, Kilombero district to the south and Mvomero district to the north and west. Morogoro District is located in North East of Morogoro Region lying between latitudes 6° 00" and 8° 00" south of equator; and between Longitudes 36° 00" and 38° 00" East of the Greenwich. According to 2022 Population and Housing Census Report, the Morogoro District had a total population of 387,736 people (NBS, 2022), while the population of Mvuha Ward is 21,478 (NBS, 2022). The conducted survey identified three (3) potential sites for drilling boreholes that will provide sustainable water supply for livestock in for the three (3) villages as described in **Table 1**.

Figure 1: Nine water basins of Tanzania

Source: Wami/Ruvu Basin Water Board

Table 1: Location of the project area in Morogoro District council

Ward	Village	Hamlet	Easting (UTM WGS84)	Northing
Mvuha	Dalla	Kilengezi	373841 E	9194378 N

Source: Consultant, 2023

2.2.2 Accessibility of the project area

The accessibility of the site project areas is through the Old Dar es Salaam Road, Morogoro Town, then Kiroka - Kibangile Road, then Lumbu - Matombo Road and finally Matombo – Dalla Village. The distance from Morogoro town to the proposed project areas is 102 kilometres.

2.2.3 Adjacent Land Use

The adjacent land use of the proposed project area is livestock grazing and subsistence farming.

2.3 Description of the Project Site

The proposed borehole drilling site in this village is located at Kilengezi hamlet, Dalla Village, Mvuha Ward, 373841E, 9194378 N (UTM WGS84), and observed altitude of 153 metres above the mean Sea Level. The proposed ground circular storage tank location is at 373828 E, 9194218 N with an altitude of 153 metres above mean Sea Level. The proposed maximum drilling depth for this borehole site is up to 140 m. There nearby properties or facilities includes existing cattle trough about 40 m from the proposed borehole drilling site. A gentle sloped area is proposed for construction of water supply systems at Dalla Village. The vegetation cover comprises of few large to small trees and short grasses.

According to the data obtained from the village office, the Livestock population is described in **Table 2**, where the common livestock such as, cattle, goat, sheep, and donkey were considered.

Figure 2: Proposed site for borehole drilling and water supply system construction at Dalla village
Source: Consultant, 2023

Table 2: Livestock population at Dalla village

S/No	Livestock	Population increase after 10 years is estimated at 25%	Population	Water Demand	Net water Demand
				liters/ day	liters/ day
1	Cattle	25	1019	50	50950
2	Goat	25	307	10	3070
3	Sheep	25	58	10	580
4	Donkey	25	115	30	3450
5	Pastoralist	20	90	30	2700

Source: Dalla Village Office

2.4 Proximal to sensitive ecosystem

There are no identified sensitive tree species near the village site. Generally the vegetation cover is characterized by few small to large trees.

2.5 Project Components

The following components will be established / constructed in each of the proposed project village site.

1. One Borehole drilling
2. One Storage tank
3. One cattle trough
4. One Domestic point (DP)

2.5.1 Borehole Drilling

To each village the single borehole will be drilled with

- Borehole of depth of 130m to 150m
- Diameter of 12'' equal to 300mm
- Installed with PVC pipe of 8'' equal to 200mm

2.5.2 Storage Tank

Proposed tank will be elevated tank with the following specification

- Tower of 6m will be constructed having three beam
- Constructed tower will be also used as store
- Plastic tank of capacity of 10,000 litres (10 m^3) will be mounted while for expecting on feature expecting the concrete tank of 25m^3 to be constructed.

2.5.3 Cattle Trough

To each village the cattle trough will be constructed

- Two parallel line of cattle trough
- Each with the length of 5.4 meters and width of 0.6meters
- Water distributer in the between of two cattle trough with length of 1.5meters.

2.5.4 Domestic Point (DP)

Domestic point which will be used to fetch water by community to each village will be constructed on these phase.

2.5.5 Pump House and Toilet

Pump house with toilet will be constructed to each village. Connected house will be constructed with

- Pump house with dimensions 2500 x2 500mm
- Toilet with 1200 x 1500 mm.

2.5.6 Length of transmission and distribution lines

For Dalla Village and particularly the Kilengezi hamlet where the proposed project will be implemented will have both transmission and distribution lines that will be constructed. All project components will be constructed within the project sites covering land size of 800m^2.

Table 3: Length of transmission and distribution lines in proposed project areas

No.	Village	Hamlet	Number of trough	Number of tank	Transmission line (m)	Distribution line (m)
1.	Dalla	Kilengezi	1	1	175	132

Source: Proponent, 2024

2.6 Land Ownership

Lands for the development of the proposed projects were owned by individual persons and willingly offered them to village governments. Then Village governments handed over these pieces of land to Wami Ruvu Basin Water Board for implementing the proposed project. The total land size for the proposed project is 800m^2. Therefore, the owners of the land is Dalla Village (**Table 4**).

Table 4: Details of acquisition, ownership and size

No.	Village	Hamlet	Previous owner	Current owner	Land size (m^2)
1.	Dalla	Kilengezi	Mahogo Maguta Ngalya	Dalla Village Council	400
2.	Dalla	Kilengezi	Kuzenza Heneliko Miza	Dalla Village Council	400

Source: Proponent, 2023/2024

2.7 Project Cost

The cost for construction of water supply system is estimated to be ninety two million two hundred seventy two thousand one hundred Tanzania shillings only (TZS. 92,272,100.00).

2.8 Project phases

Implementation of the Water sector support program Phase II project will involve four phases which include:

i. Planning phase
ii. Mobilization and Construction phase
iii. Operation phase
iv. Decommissioning phase.

2.8.1 Planning phase

The project planning step includes a feasibility study, preparation of EIA, preliminary engineering planning, final engineering planning, preparation of tendering document and acquiring other relevant permit such as water use permit and drilling borehole permit. Planning phase for proposed project of drilling borehole and water supply network at four village at Morogoro District under Water sector support program phase II's is performed at a level of detail, which ensures that the plan is technically, financially and environmentally feasible. Since Tanzanian legislation requires an Environmental and Social Impact Assessment (ESIA), so Environmental Impact at this phase is assessed according to the Environmental Management Act, 2004 and its EIA and Audit Regulations, 2005 and amendments of 2018 during the preliminary engineering planning phase. The approval decision is made on the preliminary engineering plan. The proposed subproject shall not involve any kind of compensation prior to commencement of construction activities since the Land where legally owned to their village government councils. This phase will last for a period of four to six month.

2.8.2 Design criteria

According to design criteria the proposed project has design for period 20-years and will be extended depend on the maintenance of the project. The key components considered in the design of the proposed project include the following;

i. Borehole depth and its components such as pump house
ii. Rising main
iii. Supply Main
iv. Storage tanks
v. Water Consumption points (cattle troughs and DPs)

The design of water supply infrastructures and associated structural and civil works has been done based on the Ministry of Water Design Manual 2009 among other standards, design codes, and consultant's vast experience and skills.

2.8.2.1 Space Configurations

- Be designed with fire protection capacity as recommended by fire and rescue forces.
- Maximize utilization of space to accommodate all the designed infrastructures such as borehole, cattle trough and storage tanks in the provided area.
- Optimize layout and configuration water supply systems.

2.8.2.2 Durability / Functional

- Be designed to accommodate all the livestock and pastoralists in the proposed project areas throughout the design period.

2.8.2.3 Safety / Security of Personnel and Material

- Incorporate proper signage to clearly warn of hazards or to direct personnel to take precaution particularly near the borehole and pump house area.
- Provide fencing in the boreholes, and storage tank area for protection.

2.8.2.4 Climate Change Considerations

The two major climatic concerns identified and considered in the designs for the proposed water supply systems includes floods from increased precipitation.

2.8.3 Mobilization and Construction Phase

The proponent will engage a local and registered construction company in constructing the project site. The contactor will be responsible for drilling borehole, sourcing of construction materials, Labour recruitment and perform actual construction work. Due to clearance and other activities during construction a significant amount of spoil material will be generated which will be used as filling materials. These phase expecting to be conducted for twelve (12) months. The following are activities will be conducted:

- Collection, storage, transportation, treatment and disposal of wastes generated
- Actual construction works
- Landscaping and environmental restoration
- Implementation of the ESMP.

The construction component includes;

i. Water storage tank foundation and fence;
ii. One cattle trough; and
iii. One Domestic point (DP).

2.8.3.1 Construction Material, Transportation and Storage

During construction phase different construction material will required and shall be sourced local or other place outside the district and should be transported to respectively village site via different accessible road in order for implementation of proposed project as discussing in preceding sections.

2.8.3.2 Source of Earth materials

In the proposed project an initial study of material sources to be employed during construction were conducted. Potential venues have been discovered, and others will be sought and researched. The materials studied are utilized in foundation, mortar, and concrete work. Additional materials research on the availability of alternative sources, in addition to the present ones, will be conducted.

2.8.3.2.1 Gravel Material

All gravel materials are available near the village at about 5 km from the project site. Local suppliers at the village are the main sources of the gravel materials.

2.8.3.2.2 Sand

Near the proposed project site, sand burrows areas are available and sand is supplied by local suppliers hence can be obtained and used during construction phase.

2.8.3.2.3 Hard stones

Stones for construction purposes are available within the village and they can be supplied. The price and sources of construction materials is summarized in the **Table 5**.

2.8.3.2.4 Manufacturing Construction Material

Proposed drilled of borehole and construction of water supply scheme has required material which are processed or manufactured from the industry. These materials will be sourced within the

Morogoro region or outside the region or imported from South Africa or China. The following are some of material and were expecting to be sourced.

2.8.3.2.5 Conduit pipes

Proposed project requires pipes either HDPE or UPVC or GS pipes which will be sourced within Tanzania in the industries that produce the pipes, in case these materials required are not available in the country the developer will order it from other country (import). Sorting of Industry and supplier of this pipe is in progress.

2.8.3.2.6 Pump

Proposed project is expecting to drill the borehole of depth between 130 - 150m which requires the pump with higher capacity to pump water to the storage tank before being supplied to final consumers. The pump will be imported from South Africa or China.

2.8.3.2.7 Electronic Equipment

Installation of water network or scheme will require electrical installation which in one way or another will use any kind of source of power from solar, wind generator or electricity. Due to that need, developer will source electronic equipment like wire, cables etc. from nominated supplier of electronic equipment such as Africable Limited.

2.8.3.2.8 Cement

Cement for preparation of mortar in construction activities or preparation of concrete will be sourced from either Morogoro, Tanga or Dar es Salaam regions.

2.8.3.2.9 Corrugated Iron sheet and Steel Bars

These materials will be used in fencing construction site temporary and in the preparation of base of DP and Cattle trough. Material are available to many part of Tanzania so developer will used the local supply from Morogoro to obtain these products.

Table 5: Sources and prices of construction materials

Construction material	Price (TZS)	Quantity(to each site)	Source
Sand	7,000.00 per $15m^3$ truck	4 truck	Local suppliers at respective wards
Gravel	65,000.00 per $15m^3$ truck	4 truck	Local suppliers at respective wards
Hard stones	120,000.00 per $15m^3$ truck	4 truck	Local suppliers at respective wards
Cement	20,000.00 Per 50 kg sack	1000 bags	Local suppliers at Tanga, Dar es Salam and Morogoro
Pipes	Different size	To be determined	Dar es Salaam or imported
Electronic equipment	To be determined	To be determined	Africable Limited
Pumps	To be determined	1	Imported
Corrugated Iron sheet and Steel Bars	To be determined	To be determined	Local suppliers at Dar es Salam and Morogoro

Construction material	Price (TZS)	Quantity(to each site)	Source
Water	To be determined	To be determined	Surface stream/river near the proposed project
Power	Generator (250KVa)	1	Local suppliers at Dar es Salam and Morogoro

Source: Consultant, 2023

2.8.3.3 Wastes Generated and its Management during Mobilization and Construction phase

Proposed drilling of boreholes and construction of water supply system/scheme has generated all kind wastes from solid liquid and air/gaseous waste. The estimated quantity and its management have been presented as follow:

2.8.3.3.1 Solid Wastes

Construction activities in the proposed projects will generate solid wastes which are degradable (non-hazardous) and hazardous wastes. In these case we describe the non-hazardous waste generated from construction site such as remain of foods form workers, plastic bags (cements bags), piece of pipes (not GS pipe), piece of woods, plastic bottles etc. An average estimate of waste generated is 8kg/site/day. To manage these wastes developer should guide the contractor on having a properly waste management plan onsite. Contractor should ensure the wastes at source is sorting by providing waste bin to all target area and to have onsite degradable dump for those food waste and for that required reuse such as plastic bottle should find the licensed dealer to collect it from site for recycle it.

2.8.3.3.2 Liquid wastes

During construction phase the liquid waste generated include that from black water as common types of waste generated. To manage liquid waste developer should construct the temporary toilet in order to be used as management practice of sanitary waste. Also to ensure is well supply to clean water for safety of worker and avoid spread of disease and environmental pollution. Also these temporary toilets should be constructed far from drilled borehole to avoid underground water pollution at least 10m from position of borehole.

2.8.3.3.3 Hazardous waste

In the proposed drilled borehole and construction of water supply system, hazardous waste generated range from solid to liquid waste as follow

- The solid hazardous waste which will expecting to be generated include piece of steel bars, boxes, paper, corrugated iron sheet, GS pipe if used, bottle of color etc. its expecting average generation of it is 150 kg at the end of construction activities. The developer shall prepare the specific area and call it as scrap metal storage to collect these waste and at the end should be sold to scrap metal dealers; and
- The liquid hazardous waste as little will be expecting from generator and drilled machine servicing which is oil waste. The contractor shall ensure these waste is managed properly by paving the area where will be used for servicing machine and in the generator should be in bounded wall.

2.8.3.3.4 Electrical and Electronic Waste

Proposed project will involve the electrical installation system which uses electronic equipment's, so generation of piece of wire cables etc. will be expecting. The average quantity of E-waste generate per project is 5kg. Contractor shall collect it properly and send to E-waste collector and disposal agents for over see if it can be recycling or disposal.

2.8.3.4 Current status of the project during construction phase

Currently the project construction has started and it is at sixty (60) percent of construction. The project has managed to mobilize materials to the site which include the mobilization of machines and equipment, construction materials, water tanks and pipes. Other activities include construction of pump house and toilet, erection of water tank tower, excavation, pipe placement, jointing, and backfilling of water supply system, construction of domestic point (DP) for water tapping, and construction of cattle troughs among others as shown in the figures below.

Figure 3: Photos of Water tank tower (L) and the Domestic Point (PD) (R) under construction

Figure 4: Photos of Cattle trough (L) and Guard house and toilet (R) under construction

Source: Consultant, 2025

2.8.4 Operation Phase

Once construction is completed, Proponent shall hand over the project to RUWASA for all operation and supervision issues of the project site. RUWASA will be responsible for construction, supervising and regulating water supply services in rural areas. Pastoralists will have an easy access to safe and

clean water for their livestock throughout the year at the consumption points. As per design the proposed project will last for 20 years.

2.8.4.1 Waste Generated and Management during Operation Phase

Operation of Drilled Boreholes and Water Supply network will not be subjected to generate much waste. The waste generated during these phase include the following below as involvement of maintenance activities and expecting to have security guard for security of project.

2.8.4.1.1 Solid Wastes

The solid waste generated during these phase include mostly domestic waste such as remain of food waste produced by security guard, papers and boxes carry material during maintenance. The quantity generated of waste will be 10kg/month. Developer should ensure the wastes at source are sorting by providing waste bin to all target area and to have onsite degradable dump for those degradable waste.

2.8.4.1.2 Liquid Wastes

The liquid waste generated from proposed site during operation phase generated from sanitary facility such as toilet. In the proposed project the constructed permanent toilet will be considering as management practice to these liquid waste.

2.8.4.1.3 Hazardous Waste

During the operation phase the hazardous waste generated may result when servicing and maintenance will be performing, these may include oil spillage, scrap metal etc. the developer shall prepare the good mechanism for handling them when happening.

2.8.4.1.4 Electrical and Electronic Waste

During operation of proposed project will involve the repair of electrical installation system which uses electronic equipment's, so generation of piece of wire cables etc. will be expected. Developer shall collect it properly and send to e-waste collector and disposal agents for over see if it can be recycling or disposal.

2.8.5 Decommissioning Phase

The decommissioning phase will entail implementation of land Act (Cap 114) and its amendments by returning the land into state that would be usable by others after completion of the project. Activities during these phase include demolition of construction structure, rehabilitate and vegetate all cleared areas, termination of workers by paying them their terminal benefits and auction machines and equipment of useful value and those of no use to the proponent be given to smelters and recyclers.

2.8.6 Other Supporting Infrastructure and Utilities

2.8.6.1 Power Supply

Proposed project will use standby diesel generator during construction and solar during operation phase since the electricity is not available near the proposed project site.

2.8.6.2 Water supply

The water to be used during construction phase will be sourced from surface water stream found within the village.

2.8.6.3 Fencing

The proposed project infrastructures particularly the boreholes, pump house and storage tanks shall be fenced and guarded for their protection.

2.8.7 Project Schedule

The Water Sector Support Program Phase II construction shall start as soon as possible after the complete approval of all necessary studies. The average construction time is expected to be twelve (12) months, and operation is designed for the next 20 years.

2.8.8 Health and Safety Issues

Proposed drilling of borehole and construction of water supply scheme involves various safety and health considerations due to the nature of the activities and the presence of infrastructure and equipment. Here are the safety and health issues that the project proponent should take into consideration.

2.8.8.1 Fire Safety

- Implement adequate fire prevention measures, including fire detection and suppression systems, regular inspections, and adherence to fire safety protocols, to minimize the risk of fire incidents as fire prevention.
- Develop will defined a well emergency response procedures, including evacuation plans and trained personnel, to ensure a swift and organized response in case of a fire emergency or other emergencies.

2.8.8.2 Ergonomics and Manual Handling

- Manual Handling Training: Provide workers with training on proper manual handling techniques, such as lifting, carrying, and moving heavy objects, to prevent strains and injuries.

2.8.9 Occupational Health and Safety

Safety and Health issues will be followed accordingly in all phases by following the OHS Act, 2003 whereby during the construction the workers must be provided with appropriate protective gears and must be safety officers in the project site and representatives committee to overlook all the safety issues with other supporting regulations such as OHS construction rules of 2015 will be implementing.

2.8.10 Emergency Response Plan

Emergencies are undesired event or incidences that require immediate response and attention. In most likely situations, require evacuation to prevent or reduce injuries to personnel, damage to property and environment. Possible emergencies that will be considered include; Fire emergencies, accidents emergencies which may occur due to trips and falls. The proponent shall develop an emergency response plan to deal with all occurrences as and when it occurs during the project construction to decommissioning phases.

2.8.11 Incident Reporting

Procedure for reporting all emergencies and implementation of corrective actions will be developed by the contractors during construction phase. All incidences recorded shall be reported to the Leaders in charge.

CHAPTER THREE

3.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 Overview

This section is aimed at reviewing relevant environmental resource and planning legislations and regulations to ensure that construction and operation of water supply systems for livestock meets policy and legislative criteria, World Bank's Environmental and Social Standards (ESSs) and that all relevant requirements are built into project design and implementation. The review also outlines specific procedures and measures to be carried out before, during and after project development. The following are identified policies, legislations and International Conventions that have been reviewed and included in this ESIA describing their relevance to these proposed subprojects.

3.2 National Policies

The national policies that address environmental and social management as far as bus terminals subproject is concerned and which form the cornerstone of the present study include but not limited to the following:

3.2.1 National Environment Policy (2021)

The overall objectives of the National Environment Policy (NEP) are:

- To ensure sustainability, security and equitable use of resources for meeting the basic needs of the present and future generations without degrading the environment or risk health or safety;
- To prevent and control degradation of land, water, vegetation and air which constitute our life support systems;
- To conserve and enhance our natural and manmade heritage, including the biological diversity of the unique ecosystems of Tanzania;
- To improve the condition and productivity of degraded areas including rural and urban settlements in order that all Tanzanians may live in safe, healthful, productive and aesthetically pleasing surroundings;
- To raise public awareness and understanding of the essential linkages between environment and development, and to promote individual and community participation in environmental actions;
- To promote international cooperation on the environment agenda, and expand our participation and contribution to relevant bilateral, sub-regional, regional, and global organizations and programs including implementation of Treaties.

The National Environmental Policy seeks to provide the framework for making fundamental changes that are needed to bring environmental and social considerations into the mainstream of decision making in Tanzania. It seeks to provide policy guidelines and plans, give guidance to the determination of priority actions, and provide for monitoring and regular reviews of policies, plans and programmes. It further provides for sectoral and cross-sectoral policy analysis in order to achieve compatibility among sectors.

3.2.2 National Water Policy (2002)

The overall objective of the policy is to develop a comprehensive framework for sustainable management of the national water resources. The policy seeks to ensure that water plays an

important role in poverty alleviation. Section 2.15 of the policy state that, the scale of geography of Tanzania means that communication is time consuming and expensive. The inadequate communication system affects the effective implementation of water resources management activities in terms of higher cost of monitoring, supervision, policing and data transfer. This road development will help to alleviate accessibility problems and thus facilitate enhancement of water resources management within the project influence area. The policy recognizes the role of basins as one of the effective tools in the implementation of water resource management activities.

3.2.3 Agriculture and Livestock Policy (1997)

The Agriculture and Livestock Policy takes cognizance of the importance of conservation of natural resources and environment. This is clearly indicated in one of its objectives that states, "To balance the optimal use and conservation of natural resources i.e. land, soils, water and vegetation so as to conserve the environment".

The policy developed Agricultural Sector Development Strategy (ASDS) 2001, with the aim to create an enabling and conducive environment for improving the productivity and profitability of the agricultural sector as the basis for improved farm incomes and reducing rural poverty in the medium and long term.

Various innovative and practical actions are included in the ASDS as part of its strategy such as:

- A focus that agricultural productivity and profitability to come first;
- The promotion of private sector/public sector and processor/contract grower partnerships;

The participatory implementation of the strategy through District Agricultural Development Plans (DADPS). Generally, all aforementioned policies underscored the importance of applying Environmental Impact Assessment in developing projects as it provides policy guidance on choices to maximize long-term benefits of development and environmental objectives. EIA as a planning tool shall be used to integrate environmental consideration in the decision-making process to ensure that unnecessary damage to environmental is avoided.

3.2.4 National Mineral Policy (2009)

The National Mineral Policy also addresses that the mining activities should be undertaken in a sustainable manner. Reclamation of lands after mining activities is recommended. As far as this project is concerned, mining activities are directed to quarrying activities, borrow pitting and sand mining. Therefore, extraction of building materials from quarries and borrow pits for proposed drilling borehole and construction of water supply system shall be done in a manner that do not environmentally contravene the policy provisions including extracting materials to the authorized areas. To complies with these policy, Developer has already investigate and get the local supply of the earth material in the respectively village.

3.2.5 National Gender Development Policy (2000)

The key objective of the policy is to provide guidelines that will ensure that gender sensitive plans and strategies in all sectors and institutions are developed. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on gender quality and equal opportunity for both men and women to participate in development undertakings and to value the role-played by each member of

the society. Developer shall ensure the provision of equal opportunities to both men and women during implementation of proposed project in all phase as policy required.

3.2.6 National Human Settlements Development Policy (2000)

Among the policy objectives that touch the construction sector are to improve the level of the provision of infrastructure and social services for sustainable human settlements development and to make serviced land available for shelter and human settlements development in general to all sections of the communities. The infrastructure and services constitute the backbone of urban/rural economic activities. All weather roads, reliable and efficient transport system are essential to increase productivity and establishment of manufacturing industries. The proposed project of drilling boreholes and construction of water supply scheme/system will provide reduce time to village on find water and conflict of pastoralism and farmers and improve social and economic development at respectively villages and Morogoro region as whole.

3.2.7 National Land Policy (1997)

The Policy advocates for an equitable distribution and access to land by all citizens. It aims to ensure that existing rights in the land, especially customary rights of small holders (i.e. Peasants and herdsmen who form the majority of the country's population) are recognized, clarified, and secured by law. Under the policy framework land is to be put to its most productive use to promote rapid social and economic development of the country among other objectives.

The National Land Policy recognizes the need for protecting environmentally sensitive areas. The policy emphasizes on the protection of environment and natural ecosystems from pollution, degradation, and physical destruction. In addition, the policy recognizes the importance of social services such as water, roads, energy, and solid waste management for environmental protection. Finally, the policy identifies the need for conservation and preservation of prehistoric / historic sites and buildings. The project implementation shall observe the requirements of the policy. The proposed subproject will ensure that soil erosion measures are taken into consideration during construction and afforestation plan is put forth along the project area so as to protect land resource from degradation for sustainable development.

3.2.8 National Policy on HIV/AIDS (2001)

The overall goal of the national policy on HIV/AIDS is to provide for a framework for leadership and coordination of the National multi-sectoral response to the HIV/AIDS epidemic. This includes formulation, by all sectors of appropriate interventions which will be effective in preventing transmission of HIV/AIDS and other sexually transmitted infections, protecting and supporting vulnerable groups, mitigating the social and economic impact of HIV/AIDS. It also provides for the framework for strengthening the capacity of institutions, communities and individuals in all sectors to arrest the spread of the epidemic. Being a social cultural and economic problem, prevention and control of HIV/AIDS epidemics will very much depend on effective community based prevention, care and support interventions. The local government councils will be the focal point for involving and coordinating public and private sector, NGOs and faith groups in planning and implementing of HIV/AIDS interventions, particularly community based interventions. Best experiences in community based approaches in some district in the country will be shared with local council. HIV/AIDS awareness and education will be provided by the contractor to the workers and communities. The contractor

shall be responsible for provision of free condoms to construction workers and voluntary HIV testing to both communities and workers so that to adhere to the policy.

3.2.9 National Population Policy (2006)

Among the Policy Objectives is: to harmonize population and economic growth and among the Policy Direction is to Enhance awareness to the leaders and communities about the linkages between population, resources, the environment, poverty eradication and sustainable development. The proposed drilling boreholes and construction water supply system/network in line with the policy's objectives and direction. The population near the facility will be benefit economically after completion of the project through provision of suitable environment for economic growth.

3.2.10 National Forest Policy (1998)

The National Forest Policy identifies four main areas (forest land management, forest-based industries and products, ecosystem conservation and management, institutions and human resources) and present policy statements and instruments/directives to be applied to each of these. In accordance with the policy, an Environmental and Social Impact Assessment (ESIA) will be required for all investments, which convert forestland uses or may cause damage to the forest environment. Some of the policy strategy statements that are relevant for water supply projects include the following:

- To enable sustainable management of forest on public lands, clear ownership for all forests and trees on these lands will be defined and management responsibility promoted; and
- Biodiversity conservation and management as well as watershed management and soil conservation will be included in the management plans for all protected forests.

Involvement of forestry management authority, local communities and other stakeholders in conservation will be consulted while establishing water sources and project sites.

3.2.11 Construction Industry Policy (2003)

The policy recognizes the importance of involving various organizations and persons including companies, firms and individuals working as consultants, main contractors and sub-contractors, materials and equipment producers, plant and equipment suppliers, builders and merchants. With respect to environmental protection and conservation, section 8.2.2 of the National Construction Industry Policy addresses a number of issues regarding the environment. The construction industry is generally said to be a major source of environmental damage and occupational health problems. The project construction activities will affect the environment in many ways such as resource deterioration, physical disruption, earth grabbing and pollution. The project must implement the mitigation measures that shall be recommended by the ESIA study.

3.2.12 National Transportation Policy (2011)

Out of the seven objectives and goals of this policy, only one is relevant to this project which calls for sufficient emphasis on all aspects of environmental protection and management at the design, development and operation stages of transport of infrastructure to ensure sustainability.

3.2.14 National Energy Policy (2015)

One of the objectives of National Energy Policy is to promote environmental protection, health and safety management in the energy sector. Subjecting the energy projects to Environmental Impact Assessments (EIAs) and enforcing regulations based on the Polluter Pays Principle are promoted.

Adherence to good industry standards and practices will contribute significantly to mitigating the adverse effects of energy activities on environment. Regulations of these operations are necessary to ensure that energy activities are conducted considering environment, health and safety issues. Proponent will require to be complying with the policy because; there will be measures to address the adverse environmental impacts of the project using generators as main source of power since all village lack the electricity infrastructure.

3.2.15 National Employment Policy (1997)

The major aim of this policy is to promote employment mainly of Tanzania Nationals. Relevant sections of this policy are (i) 10, which lays down strategies for promoting employment and section 10.1 is particularly focusing on industry and trade sectors (ii) 10.6 which deals with employment of special groups i.e. women, youth, persons with disabilities and (iii) 10.8 which deals with the tendencies of private industries to employ expatriate even where are equally competent nationals. The proponent will observe the above policy requirements in undertaking its activities in the area. Men and women are expected to be employed during project development to all phases of the project.

3.3 Legal and Regulatory Framework

3.3.1 Environmental Management Act (2004) as amended in 2016 and 2021

The Environmental Management Act seeks to provide for legal and institutional framework for sustainable management of the environment in the implementation of the National Environmental Policy. The Act introduces a concept of right of Tanzanians to clean, safe and healthy environment and right of Tanzanians to access various segment of environment for recreational, educational, health, spiritual, cultural and economic purposes. The Act imposes an obligation on developers to conduct an EIA prior to the commencement of the project to determine whether the project may/or is likely to have, or will have a significant impact on the environment. Under this Act NEMC is mandated to undertake enforcement, compliance, review and monitoring of environmental impact assessment and has a role of facilitating public participation in environmental decision making, exercise general supervision and coordinating over all matters relating to the environment. Section 81(1) makes EIA mandatory to all projects that fall under the EIA mandatory list (Schedule 3) into which this project falls. Undertaking this study at this stage the proponent has complied with provision of the Act as far as environmental impact assessment is concerned.

3.3.2 Water Resources Management Act No 11 of (2009)

The Act provides a description of water resource management framework in Tanzania including roles and responsibilities of every actor and related stakeholders. One of the Key objectives of this Act in Part II section 4(1) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account the fundamental principles of sustainability including subsection (h) preventing and controlling pollution and degradation of water resources. The proponent adhere to the objective of this Act by ensuring that water sources are protected from pollution by establishing the proposed drilling of boreholes and construction of water supply system/schemes to prevent pollution to natural stream/river cross in the respectively villages.

The provision of Part VI, section 39(1) requires that the owner or occupier of land on which any activity or process is performed which is likely to cause pollution of a water source, shall take all reasonable measures to prevent any such pollution from occurring, continuing or recurring. The developer will

complies with this Act by adhering to proper waste management practices during construction activities. The provision of Part VIIA, section 43(1) requires that any person who diverts, dams, stores, abstracts or uses water from surface or underground water source, or for any such purpose constructs or maintains any works, shall apply for a Water Use Permit in accordance with this Act. And subject to section 45(2) The Basin Water Board may grant the applicant a temporary Water Use Permit for any purpose under such conditions as may be deemed fit. In addition to section 48 (b) as the user of water use permit granted under this Act you are required to prevent any damage to the source from which water is taken, or to which water is discharged after use.

3.3.3 National Environmental Impact and Auditing Regulations (2018)

According to this regulation, the developer first registers the project, by submitting Form EA1 to NEMC, with outline details of the project and its likely impacts. The regulations advocate for periodic and independent reassessment and that the outcome of such assessment will serve to provide instructive feedback into the environmental management process. Environmental Impact Statement (EIS) will be submitted to the Technical Advisory Committee (TAC) coordinated by NEMC for review.

3.3.4 Energy and Water Utilities Authority (EWURA) Act (2011)

This Act provides guidance in EWURA administrative system by specifying roles and responsibilities of every actor and related stakeholders, power and proceedings of authority, complains and dispute resolutions, enforcement and compliance. The provision Part II section 6(f) dictates that it shall be the duty of authority (Energy and Water Utilities Regulatory Authority) that in carrying out its functions it shall strive to enhance the welfare of Tanzanians society by taking into account the need to protect and preserve the environment. The proposed drilling boreholes and construction of water supply schemes project through the contractor shall take into account the need to preserve and protect environment by ensuring good storage and transportation of fuel, control oil seepage and ensure proper re-use or disposal of waste oil.

3.3.5 Mining Act (2019)

This Act provides guidance on general principles, administrative system of mineral in Tanzania and responsibilities of each actor and related stakeholders, categorizations of mineral rights, types of mineral licenses, charges, right of entry, registration and dispute settlement. One of the key general principles of this Act in Part II, section 6(1) states that no person shall, on or in any land to which this Act applies, prospect for minerals or carry on mining operations except under the authority of a mineral right granted or deemed to have been granted, under this Act. However section 7(3) states that nothing in this Act shall prevent any person engaged in the construction of tunnels, road, dams, aerodromes and similar public works of an engineering nature from utilizing as building materials any minerals derived from a source approved by the Minister in writing. The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of this Act by ensuring that all suppliers/sources for aggregates and sand are licensed by the Ministry of Minerals.

3.3.6 Occupational Health and Safety Act (2003)

This act provides guidance on health and safety administrative system and responsibilities of every actor, requirements and procedures for registration of workplaces, safety provision, health and welfare provisions, safety special provision, hazardous material and processes, chemical handling provisions, offences penalties and regal proceedings. The provisions of Part III, section 15 requires

that there shall be a register of work place in which inspector shall enter such particulars in relation to every work place as he may consider necessary for the purpose of this Act and subject to section 16(1) that any person being an occupier of the work place shall before operating being required to register under this Act. The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of this Act by ensuring that the contractor registers the work place by following all required procedures under this Act.

The provisions of Part IV section 24, requires that all employees will be provided periodic occupation medical examination carried out by qualified occupational health physician for fitness for employment and all the expenses and prescribed fee will be paid by the employer. Subject to the provisions of Section 26 which requires that the employees should be protected from every danger of machinery use through fencing and by providing operator with protective safety devices from machinery parties. Section 27 that efficiency of machine should be provided and maintained; section 28 and 30 that an examination or lubrication, adjustment or cleaning of the machinery should not be carried out while the machine is in motion. And section 32 that corrosive or poisonous liquids should be covered or fenced to reasonable height according to the nature of the work and a warning sign should be posted to the plant or nearby.

Also subject to the provisions of Part IV, section 50(1)a), the employer shall ensure that the workplace is equipped with fire extinguishers which shall be adequate and suitable having regard to fire risks; and paragraph (b) stocks of inflammable materials should be kept in a safe place. The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of part IV of this Act by ensuring that all protection needed for safety of employees are provided as required. The provisions of Part V, section 54(1), requires that the employer shall ensure supply of safe and clean drinking water that is readily accessible to all employees; section 55(1)sufficient and suitable sanitary conveniences shall be provided in a work place and shall be maintained and kept clean and shall be provided with lighting. Section 65(1) there should be washing facilities which should be kept clean and orderly condition. And section 58 there should be provision of first aid box, a person trained and qualifies for first aid and there should be reliable means of transport if a person required further medical attention.

The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of Part V of this Act by ensuring that all requirements are met include providing clean drinking water and hygiene services. The provisions of Part VI, section 60(a) requires that in work environment where activities involve hazardous chemical substances, equipment and processes which are likely to result in adverse health effects to people or environment, the employer shall ensure that risks assessment is done either annually or when deems necessary by approved inspector. Sub-project to section 61(1) that all practical measures should be taken to protect employees against inhalation of dust or fume or any impurity and against the working environment.

The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of part VI of this Act by ensuring that all protective devices are provided as stipulated in Environmental Management Plan and required by this Act. The provisions of Part VII, section 67(1) and (2) requires that toxic materials or substances shall only be used where the use of non-toxic materials is not reasonably practicable. During this situation the number of employees

exposed should be low and recognized antidote should be kept ready. Subject to section 68 that where there is dangerous or corrosive liquids in case of emergence there should be ready and accessible means of drenching with water for any person who has been splashed with such liquid. And Section 71 that no employer shall make an employee carry out work that is not adapted to their physical and cognitive capabilities and limitation.

The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of part VII of this Act by ensuring that all precaution measures are taken against hazardous substances as recommended in Environmental Management Plan and by this Act. The provisions of Part VIII, section 73(1) the employer shall ensure that preventive, administrative and technical measures are taken to prevent or reduce contamination to workers and the environment and subsection (7) that shall ensure proper disposal of all chemical containers and residues. The provisions of Part X, section 89(1) requires that there should be posted prescribed abstract of this Act at work place and any other notice and document required by this Act in both Kiswahili and English. Subject to section 103 requires that no employer shall dismiss an employee, reduce rate of his remuneration, alter terms or his employment or position to his advantages by the reason of the fact or because he suspects or believes whether or not the suspicion is justified or not, however in subsection (2) the employer may terminate the employment of employee if is unable to work for reasons of health condition. The proposed drilling of boreholes and construction of water supply system/scheme project will comply with the provisions of part X of this Act by ensuring that all safety rules are posted, safety policy are developed and employment rights are observed related to Health and Safety as recommended in Environmental Management Plan and by this Act.

3.3.7 HIV and AIDS (Prevention and Control) Act (2008)

The HIV and AIDS Act gives provision of general duties by specifying general responsibilities of every actor, emphasize on provision of public education and programs on HIV and AIDS, testing and counseling, confidentiality, health and support services, stigma and discrimination, rights and obligations of persons living with HIV and offences and penalties. The provisions of Part II, section 4(1) a) requires that Every person, institution and organization living, registered or operating in Tanzania shall, be under the general duty to promote public awareness on causes, modes of transmission, consequences, prevention and control of HIV and AIDS; also subsection (2) a) and b) integrate or priorities on HIV and AIDS in their proceedings and public appearances; and advocate against stigma and discrimination of people living with HIV and AIDS.

Subject to the provisions of section 6 (1) that every ministry, department, agency, local government authority, parastatal organization, institution whether public or private, shall design and implement gender and disability responsive HIV and AIDS plans in its respective area and such plans shall be main streamed and implemented within the activities of such sector. Subject to subsection (4) every sector preparing a plan or programme under this section shall before implementation of such plan or programme, submit them to TACAIDS for coordination and advice. The developer will comply with the provisions of this Act by ensuring that HIV and AIDS awareness and education is provided to workers and all people living along the project site.

3.3.8 The Village Land Act (Cap 114) R.E 2019

The village Act provides directions on management and administration of village land by specifying roles and responsibilities of every actor gives guidance on provision of village land tenure systems and right of occupancy as well as responsible authorities and procedures. The provisions of Part IV, section 7(1)a)defines village land as land within the boundaries of a village registered in accordance with the provisions of section 22 of the Local government (District Authorities) Acts 1982.

The objectives of Village Land Act are based on application of the fundamental principles of land use policy as directed in part II, section3. Such principles include subsection (l) g) to pay full; fair and prompt compensation to any person whose right of occupancy or recognized long-standing customary occupation or use of land is revoked or otherwise interfered with to their detriment by the State under this Act or is acquired under the Land. The provisions of Part II, Section 3(2) requires that the right of every woman to acquire, hold, use and deal with land shall to the same extent and subject to the same restriction be treated as the right of any man, is hereby declared to be law. The provisions of Part IV, section 17 (5) requires that, On and after the coming into operation of this Act, a non-village organization which wishes to obtain a portion of village land for the better carrying on of its operations may apply to the village council for that land, and the village council shall recommend to the Commissioner for the grant or refusal of such grant. The proposed drilling of borehole and construction of water supply system/schemes Project will comply with this Act by ensuring that full and fair compensation are done in case of a land owned by any person whose right of occupancy is interfered with activities of project construction although all lands where owned by villages so no any compensation to be paid.

3.3.9 Land Act (Cap 113) R.E 2019

This Act has provided general amendments of Land Act of 1999 by adding section 2 which identifies a "sale" be used as transfer of interest in or over land on condition attached to a granted right of occupancy. Section 19 requires that a person who is in a cooperate body or company made under company ordinance including a corporate body the majority of whose shareholders or owners are noncitizens, may only obtain be offered right of occupancy approved by Tanzania Investment Act 1997 to facilitate compliance with development. Section 20 which clarifies that land acquired by non-citizen will have no value except shall be paid compensation on unexhausted improvement. Section 37 explains the sale of right of occupancy and repeal and substation of part X that gives guidance on mortgage, Mortgage right of occupancy, lease, sublease and subsequent mortgage. And also explains rights and responsibility of all actors and stakeholders including mortgagor and mortgagee.

3.3.10 Standards Act (2009)

The 2009 standard Act has clarified administrative system governing the Tanzania bureau of standards by specifying roles and responsibilities of each actor, financial provision, and establishment of standards and enforcement of provision. The provision of Part IV, section 18 subsection (1) states that the Minister may, on the recommendation of the board of the Bureau of Standards, subject to the provisions of subsections (2) and (3), by notice published marks in the Gazette, declare any mark which has been approved by the Bureau in respect of any standard prescribed or recognized by the Bureau for any commodity or the manufacturing, production, processing or treatment of any commodity, to be a standards mark in respect of it and may, in like manner, cancel or amend that mark.

The provisions of section 19 requires that every person who is required to make a statement in a contract, tender, quotation or other similar document as to the question whether the commodity offered or supplied by him complies with or has been manufactured in accordance with a particular National Standard, shall make such a statement provided compliance therewith has been verified by the Bureau. Also subject to the provisions of Part V, section22, subsection(2) requires that every person to whom a license has been issued to offer a calibration service shall be required to submit such samples of any commodity to the Bureau for calibration against the National Measurement Standard of his equipment or instrument.

3.3.11 Land Acquisition Act (Cap 118) (2019)

The act offers clarification on the power of the president to acquire land in the public interest or national economy, compensation on land acquired and related conditions, notice and proceedings where the land is withheld and declaration of right of occupancy. The provision of part II, section 3 clarify that the President may, subject to the provisions of this Act, acquire any land for any estate or term where such land is required for any public purpose. Subject to paragraph (a) subsection (1) section 5 which clarifies that as seen fit by the president that land in certain locally should be examined for the view to its possible acquisition for public interest then workmen authorized by the minister in his behalf are then allowed to enter the land for survey and paragraph (d) to clear, set out and mark the boundaries of the land proposed to be taken and the intended line of the work proposed.

Subject to subsection (2) that as soon as conveniently may be after any entry made under subsection (1), the Government shall pay for all damage done in consequence of the exercise of any of the powers conferred by subsection (1), and, in the case of a dispute as to the amount to be paid, either the Minister or the person claiming compensation may refer such dispute to the Regional Commissioner for the region in which the land is situate and the decision of the Regional Commissioner shall be final. The provisions of part II (b), section 11 subsection (1) required that, where any land is acquired by the President under section 3 the Minister shall on behalf of the Government pay in respect thereof, out of moneys provided for the purpose by Parliament, such compensation as may be agreed upon or determined in accordance with the provisions of this Act. Section 12(2) whether such land is in an urban area or in a rural area, any compensation awarded shall be limited to the value of the unexhausted improvements of the land.

Also subject to the provisions of paragraph (a-d) section 30 clarifies that it shall be lawful for the President to require any corporation to which land has been declared for use to enter a contract with the Government with regard to payment of compensation cost of acquired land, terms of land use, time of land to be used and terms to which the public will be entitled to use and benefit from the work done by corporation. The provisions of section36, subsection (1) requires that the minister will grant development proponent a right of occupancy over the land for proposed project, the provision of section 37(3) requires that the development proponent make full disclosure of all trust and other referred interests on the land in a specified time without which or by falsifying the statement shall be convicted. Section 38(1) and (2) specify that no fees or stamp duty shall be paid under land ordinance for such granted right of occupancy on the first registration. Therefore, the project will comply with all the provisions of this Act by ensuring that all the requirements for the granted right of occupancy are met including payment of compensations to land holders.

3.3.12 Roads Act (2007)

Part IX of the Act provides for offences and penalties against the contravention of the provisions of the Act. Furthermore, the Act stipulates that the Road authority shall be compensated in respect of the expenses incurred while repairing the road damaged by any person. The proponent shall observe the relevant section of the Act by ensuring that his project will be located outside the road reserve.

3.3.13 Contractors Registration Act (2003)

This Act provides general provisions on roles and responsibility of contractor's Board and every other related actor, gives guidance on registration procedures and necessary conditions. The provisions of section 7 subsection (1) part III, states that the Registrar shall keep and maintain registers of contractors of different types, categories and classes in which the name of every person entitled to have his name in them as a registered contractor. Subject to this is subsection (6) in the case of an individual, the qualifications and skills as prescribed by the Board necessary to enable him to discharge in satisfactory manner the obligations which he may reasonably be expected or called upon to undertake as a contractor belonging to the category, type and class in respect of which registration is being sought.

The provision of section 10(3) requires that upon registration, the person shall be issued with a certificate of registration indicating the registration number, type, and category, and class, date of registration and duration of registration. Subject to this provision is section 32b) which gives warning that any fraudulently procures or attempts to procure, whether for himself or for any other person, registration as a contractor or a trading license for a contractor; or commits an offence. The developer will ensure to comply with the provisions of this Act by employing contractors that are registered following the procedures underlined by this Act and with relevant certificate of registration

3.3.14 Engineers Registration Act (1997 and its amendments of 2007)

This Act provides general Amendments of engineers' registration Act of 1997 by deleting and substituting new paragraphs, sections and subsections including redefining engineering project, organizations, institutions, registered engineers and firms. Also clarify the responsibility of the Board, engineers and firms' registration procedures and conditions as well as adding substitutions to help engineers graduate and technicians to get opportunities of being linked to employers and learning. The provision of subsection 7; the principal Act is amended by adding immediately after section 12 the new section 12A (1) every professional engineer or consulting engineer who has been registered under this Act, shall in addition to such registration possess practicing certificate. Subject to subsection (3) a person who practices engineering activities without valid practicing certificate, commits an offence and can be convicted.

Provision of subsection 9; Section 14 of the principal Act is amended in paragraph (a) by deleting subsection (1) and substituting for subsection (1) which requires that a person shall not employ as an engineer any person who is not a professional engineer or consulting engineer, or cause to undertake engineering works or services without employing the services of a professional engineer or consulting engineer. Subject to subsection (5) where an employer employ any person as a trainer engineer or incorporated engineer, this section shall not apply to that employee's employer.

3.3.15 Architects and Quantity Surveyors Act (1997)

This Act was enacted by the parliament to provide for establishment of a board to regulate the conduct of Architects and Quantity surveyors and architectural and quantity surveying consulting firms in Tanzania. The board is vested with powers to inspect premised or construction sites to verify whether the rules and regulations of carrying out construction projects are adhered by consulting firms. This is aimed at ensuring that appropriate professionals who are registered by the board are involved in undertaking works as required by the law. Therefore, the proponent shall abide by this Act.

3.3.16 Workers' Compensation Act (Cap 263) (R.E 2015)

The provisions of this Act stipulate on compensation issues at workplace in case of occupational injuries, accidents and occupational diseases. The provisions of the Act also describe for compensation for death at work. Furthermore, the workmen's compensation Act requires the employer to purchase workmen's compensation insurance for their employees. Proponent has taken into consideration the provisions of this Act in order to comply with our national laws. The proponent shall abide to the act by ensure the workers are compensated in case when need.

3.3.17 Employment and Labour Relations Act (Cap 366 R.E 2019)

This Act gives provisions for fundamental rights of employees including child labor, forced labor discrimination and freedom of association; Employment standards including hours, remuneration, leave and unfair termination of employment; Trade unions, employer association and federation; Organizational rights; collective bargaining; strikes and lock outs and dispute resolutions. The provision of Part II subpart A, section 5 (1)requires that no person shall employ a child under the age of fourteen years, and subsection (2) a child under eighteen should not be employed in a workplace considered hazardous. Also subject to Subpart B section 6(1) which clarifies that any person who procures, demands or imposes forced labor, commits an offence. Subpart C, subsection 7(2) requires that an employer shall register, with the Labour Commissioner, a plan to promote equal opportunity and to eliminate discrimination in the work place. And Subpart D section 9 (1) a) every employee shall have the right to form and join a trade union; and section 10(1) a) every employer shall have the right to form and join an employer's association.

The provisions of Part III, subpart A, section 14(1) requires that a contract with an employee shall be of the specified period of time and task. Section 15(1) requires that an employer shall provide employee with written statement of particulars and a statement of employee's right in a prescribed form. Subpart B, section 19(1), (3) and (5) requires that an employer shall not require or permit an employee to work more than 12 hours in any day or work overtime unless with agreement and be paid not less than one and one half times the employee's basic wage for any overtime worked. Section 20 (2) (a)and (b) requires that pregnant employees should not work night shift 2months before their due date as well as nursing mothers 2months after birth; subsection (4) an employer shall pay an employee at least 5% of that employee's basic wage for each hour worked at night as an overtime. Section 21(1) and 24(1) dictates that employees shall be given a 60 minutes break in a working day and a day off for rest and 24 hours rest a week. Subpart C section 26(1) and 28(1) a) requires calculation of wage rates applicable hourly, daily, weekly or monthly rate of pay, no deduction shall be made unless agreed by employee for respect of debt. Subpart D section 31 (1) and (4) an employee should be given leave with paid remuneration as if he was working. Section 32(1) requires that an

employee shall be entitled to sick leave and section 33(1) three months maternity leave. And Subpart E, section 37(1) it shall be unlawful for an unfair termination of an employee.

The provisions of Part IV, section 45 (1) Employer shall register into a trade union or employers' association. Part V, section 61(1) an employer shall deduct dues of a registered trade union from an employee's wages if that employee has authorized the employer to do so in the prescribed form. Section 67(1) recognizes as exclusive bargaining agent of employees and section 68(1) an employer or employers Association shall bargain in good faith with a recognized trade union. The proposed project will employ 20 direct employments to each subproject notwithstanding the provisions of this Act, the project will comply with the provisions of this Act by ensuring that all the requirements, restriction and rights of employees are respected and guided as underlined by this Act.

3.3.18 Sexual Offenses Act (1998)

An Act provide special provisions in regard to sexual and other offences to further safeguard the personal integrity, dignity, liberty and security of women and children. The provision of Section 138D subsection (3) requires that for the avoidance of doubt, unwelcome sexual advances by words or action used by a person in authority, in a working place or any other place, shall constitute the offence of sexual harassment. The proposed project will ensure to comply with the provisions of this Act by ensuring that sexual harassment offenses are translated at work place for every employee to know their rights.

3.3.19 Law of Marriage Act (Cap 29) (2019)

This Act provides the general provisions of Marriage, marriage registration, annulments and divorces and evidence of property, rights, liabilities and status marriage as well as matrimonial proceedings and offenses. The proposed project will ensure to comply with this Act by respecting marriage, employees will be required to respect their marital status and of others. In addition to this employees and public along the road project will be offered regular HIV and AIDS and gender education and awareness.

3.3.19 Child Act (Cap 13) (2019)

This Act provides general provisions of rights and welfare of the child including care and protection of a child conditions. Also clarifies responsibilities of different actors including parents in ensuring the rights of a child whether at home, foster home, school, institutionalized care, and workplace or in custody. The provision of Part II section 12 requires that a person shall not employ or engage a child in any activity that may be harmful to his health, education, mental, physical or moral development.

The provisions of Part VII, section 78(1) a person shall not employ or engage a child in any kind of exploitative labour. Subject to the provision of subsection (2) that every employer shall ensure that every child lawfully employed or engaged in accordance with the provisions of this Act is protected against any discrimination or acts which may have negative effect on him taking into consideration his age and evolving capacities. In addition to section 79(1) the child shall not be employed or engaged in a contract of the service performance which shall require a child to work at night, and subject to provision of section 81 (1) a child has a right to be paid remuneration equal to the value of the work done. The proposed drilling of boreholes and construction of water supply system/schemes will

comply with the provisions of this Act by ensuring does not employ a child or impose a forced child labour in any phase of project execution.

3.3.20 Land Use Planning Act (2007)

45. – (1) An approved plan published under section 38 shall apply to the area or zone to which it relates, whether or not it is embodied in a local government authority by-law, and every person, agency or the relevant planning authority shall comply with the requirements of the approved plan. (2) Upon approval of plan and, unless the planning authority otherwise determines, no development shall take place on land unless it is conformity with the approved plan. 47. – (1) Any landholder or occupier of land shall take all steps necessary to ensure voluntary compliance with the aspects of an approved plan that are relevant to activities carried out on the land he holds or occupies. Part VII section 48(I) of the Act also stipulates that "Where it comes to the notice of planning authority that the development of land has been, or is being carried out after the commencement of the Act, otherwise than in accordance with applicable land use plan, the planning authority may serve an enforcement notice to the owner, occupier or developer of that land.

3.3.21 Income Tax Act (Cap 332) (R.E 2019)

This is an Act to make provisions for the charge, assessment and collection of Income Tax, for the ascertainment of the income to be charged and for matters incidental thereto. According to section 78.-(1) Tax payable under this Act means- (a) income tax imposed under section 4(1), including amounts payable by a withholding agent or with holder under Division II, by an installment payer under Division III and on assessment under Division IV of this Part; (b) interest and penalties imposed by assessment Division I of Part VIII; (c) an amount required to be paid to the Commissioner in collection from a tax debtor under section. 112(9) or 128(3); and (d) an amount required to be paid to the Commissioner in respect of a tax liability of a third party under section 115(2), 116 (3) or (4), 117(2) or 118(1) or (3). (2) Tax shall be paid to the Commissioner in the form and at the place is may be prescribed. This EIA has assessed the provision of this Act and found out that the company is registered with Tanzania Revenue Authority (TRA) and has been given Tax Identification Number (TIN) certificate and that it does pay all taxes in accordance to the provisions of this Act.

3.3.22 Social Security (Regulatory Authority) Act (Cap 135) (R.E. 2015)

This is an Act to regulate the social security sector and to provide of related matters. The Part IV (23), every scheme registered under this Act shall issue an identification number to every employer and a membership number to every employee who is a member of the scheme upon his registration. Developer complies with this regulation since all its workers have been registered in the Public Service Social Security Fund (PSSSF).

3.3.23 The Company Act (Cap 212 R.E. 2019)

This is an Act to repeal and replace a law relating to companies and other associations, to provide for more comprehensive provisions for regulation and control of companies, associations and related matters. This Act needs every person who is running a company to register it as specified in this Act. The proponent shall engage registered companies under this Act during the implantation of this project. This EIA has assessed all the requirements of this Act and developer shall comply with provisions of this Act.

3.3.24 National Social Security Fund Act, (Cap 50 RE.2018)

This is An Act to establish the National Social Security Fund and to provide for its constitution, administration and other matters related to the Fund. This Act shall apply in Mainland Tanzania to provide social security services to members from private and informal sectors. According to Section 6 of the NSSF Act, the following categories of employers and employees are registrable by the Fund. Any person who is (a) employed in the private sector; (b) self-employed; (c) a foreigner employed in Mainland Tanzania; (d) employed in the international organization operating in Mainland Tanzania; and (e) any other category of persons as may be specified by the Minister upon recommendation of the Authority. (2) Every insured person shall be issued with a registration number upon registration. This EIA has assessed the provisions of this Act and the project shall adhere to this Act.

3.3.25 Local Government (District Authorities) Act, Cap 287

The Act requires the Registrar of Villages to register an area as a village and issue a Certificate of Incorporation to the village, which enables the Village Council to become a corporate body with a perpetual succession and official seal. In its corporate name, a village is capable of suing and being sued and is capable of holding, purchasing or acquiring in any other way any movable or immovable property. The District Council of Morogoro which will be affected by this Project, have the mandate to intervene on any local issues that may be related to the project. These are issues such as access to water bodies for local use, settlement etc. This EIA has assessed this Act and developer will comply.

3.3.26 Local Government Laws (Miscellaneous Amendments) Act, 2006 R.E 2010

The Act emphasizes the boundaries of the district and ward of the place where the project will be located. Urban Council formerly established in an area part of which a new urban council has been established shall continue to exist and exercise its functions in relation to the remaining area as shall be specified in the Order establishing the new council. The proposed project will be located in Mvuha Ward in Morogoro District, and Morogoro Region.

3.4 National Regulations, Plans and Strategies

In addition to the above Legislations, there are a number of Regulations and strategies that this project must need to comply with. Some of the relevant Regulations and strategies that are relevant to the proposed project include the following: -

3.4.1 The Environmental Management (Environmental Impact Assessment and Audit) Regulations, 2005 as amended by G. N. 474 of 2018

This regulation provides for requirements on how EIA and Audit should be conducted. Among other things, the Regulations in Part IV provides for basic principles of environmental impact assessment, environmental impact assessment steps and objectives of environmental impacts assessment in which the proponent should take into consideration throughout the environmental impact assessment process. Therefore, carrying out this Environmental Impact Assessment, proponent is complying with the requirements of these regulations.

3.4.2 Environmental Management (Hazardous Control and Management) Regulation (2021)

The Regulations emphasizes for proper handling of all types of hazardous materials which are harmful when in contact with humans or environment. The regulations also require the hazardous waste to be guided by principles of environment. In addition, the regulations place responsibility to the hazardous

waste generator for the sound management and disposal of such waste and that shall be liable for damage to the environment and human health arising thereby. The developer shall abide to all hazardous waste control measures especially during construction of in water structures. During operation of the project, the authority shall be provided with hazardous waste management guidelines

3.4.3 Environmental Management (Registration and Practice of Environmental Experts) Regulations, (2021)

The objectives of the regulations are to establish a system for registration of environmental experts; provide for a system of nurturing competence, knowledge, professional conduct, consistency, integrity and ethics in the carrying out of environmental impact studies and environmental audits; ensure that the conduct of environmental impact assessments or environmental audits is carried out in an independent, professional, objective and impartial manner; and provide for a code of conduct, discipline and control of environmental experts. The NEMC maintain a registry of EA and EIA experts. These regulations also set code of practice of the experts for which the Environmental experts for this project subscribe. Proposed drilling of borehole and construction of water supply system has been conducted by registered firm of environmental experts.

3.4.4 The Environmental Management (Fee and Charges) (Amendment) Regulations, 2024

Environmental Management (Fees and Charges) (Amendments) Regulations, 2024 read as one with the Environmental Management (Fees and Charges) Regulations, 2021, is an amended regulation which shows fees and charges are supposed to be paid accordingly. The proponent is supposed to know different Fees and Charges. Fees and Charges which are supposed to be known by the proponent are Fees and Charges for Review of Environmental Impact Assessment and Audit, Annual Charges for Environmental Monitoring and Audit, fees for environmental quality standards. The proponent shall be aware of these Fees and Charges and be ready to pay when needed.

3.4.5 Environmental Management Quality Standards (Control of Noise and Vibration) Regulations, (2015)

These regulations are formulated pursuant to Environmental Management Act. 2004 set Standards for the control of noise and vibration. The object of these Regulations shall be to:

- Ensure the maintenance of a healthy environment for all the people in Mainland Tanzania, the tranquility of their surrounding and their psychological well-being by regulating noise and vibration levels,
- Prescribing the maximum permissible noise and vibration levels from a facility or activity to which a person may be exposed,
- Providing for the control of noise and vibration and for mitigating measures for the reduction of noise and vibration, set baseline parameters on noise and vibration permissible levels based on a number of practical considerations and acceptable limits,
- Enforce minimum noise and vibration limits prescribed by the National Environmental Standards Committee;
- Help developers such as industrialists to keep abreast with environmentally friendly technologies; and,

- Ensure protection of human health and the environment from various sources of noise and vibration pollution. Developer shall abide by the regulations by ensuring that noise generated at the project site is within prescribed limits.

3.4.6 Environmental Management (Soil Quality Standards) Regulations, (2007)

These regulations have been made under Section 143, 144 and 230 (2) (s) of the Environmental Management Act, 2004. They are aimed at, among other things, prescribe minimum standard of soil quality to maintain, restore and enhance the inherent productivity of soil in the long term. Section 21(1) stipulates that no person is allowed to discharge effluent from industrial, commercial or any other trade into soil without a consent dully granted by the Council or any other person designated by the council for that purpose. Proponent shall make every effort to adhere to these regulations in its operations.

3.4.7 Environmental Management (Control and Management of Electric and Electronics equipment waste) Regulations, (2021)

These Regulations apply to all categories of electrical and electronic equipment wastes with respect to generation, collection, storage, transportation, importation, exportation, distribution, selling, purchasing, recycling, refurbishing, assembling, dismantling and disposal of electrical and electronic equipment waste or components, and their movement into or outside Mainland Tanzania. The main objective of these Regulations is to provide for and promote proper management of e-waste to protect human health, and environment while ensuring sustainable development. A generator of e-waste shall be responsible for the sound management and disposal of such waste and shall be liable for damage to the environment and harm occasioned as a result. This EIA assessed the provisions of this regulation and developer is committed to comply with the provisions of these regulations.

3.4.8 Environment Management (Control of Ozone Depleting Substances) Regulations, (2007)

The regulations show the products which having ozone depleting potentials which include automobile and truck conditioning units (whether incorporated in vehicles or not). Also, the regulations list domestic and commercial refrigeration and air conditioning or heat pump equipment when containing controlled substances as a refrigerant or insulating material of the product. These include:

a. Refrigerators
b. Freezers
c. Dehumidifiers
d. Water coolers
e. Ice machines and
f. Air conditioning and heat pump units

Some of the components such as air conditioners, refrigerators and vehicles will be at the premises. Vehicles will be coming in and out during all phases of project especially during operation phase that will come to deliver container for storage as well as taking container to customers. The Developer should adhere to this Act so as not to participate in ozone depleting and pay pollution cost when needed.

3.4.9 The Environmental Management (Water Quality Standards) Regulations, (2007)

These regulations have been made under Section 143, 144 and 230 (2) (s) of the Environmental Management Act, 2004. They are aimed at, among other things, setting permissible limits for district

and industrial effluents, special permissible limits for chrome tanning industries, special tolerance limits for vegetable industry, special tolerance limits for fertilizer industry, taste, color and smell of potable water and Chemical and physical limits for quality of Drinking Water Supplies. Developer shall abide by the regulations by ensuring that waste water are properly managed and not discharged into the open environment to avoid pollution of surface and ground water.

3.4.10 Fire and Rescue Force (Safety Inspection and Certificates) Regulations, (2017)

Any person who is an owner or operator of the premises, vehicle vessel or any conveyance facility which has not been inspected and issued with fire and safety certificate by fire authority shall apply for conduct of inspection in his premises, vehicles vessels or any other conveyance facility. This proposed project shall comply with these regulations by applying for fire safety, inspection and certificate from fire and rescue force authority after commence of operation phase.

3.4.11 Rural Sector Development Strategy (2001)

The overall objective of the Rural Development Strategy is to provide a strategic framework that will facilitate the co-coordinated implementation of sector policies and strategies concerned with the development of rural communities. The strategies to be used to enhance rural development include:

- Promoting Widely Shared Growth through reform of relevant policies and institutions in order to promote investment in rural areas:
- Supporting development of sustainable rural financial services;
- Mainstreaming new institutional arrangements in extension;
- Improving water management system to raise yields and reduce risks of crop failure;
- Increasing crop and livestock productivity and quality of products for domestic and export markets;
- Promoting sustainable utilization of natural resources; and
- Improving access to marketing, infrastructure and information.

The strategic Priority Areas include: Agricultural and Livestock Development, Development of Small and Medium Scale Enterprises, Skills Development, Natural Resource Management and Utilization, Increasing Opportunities and Access to Services, Education, Health, Rural Water Supply and Sanitation, Housing and Good Shelter, Road Network Infrastructure, Information, Communication Technology, Energy and Reducing Risks and Vulnerability. Proposed project will contribute to some of the above e.g. water supply system, Information, Communication Technology and road network.

3.4.12 VPO Strategy for Conservation of Land and Water Catchment Areas (2006)

Among several challenges identified by this strategy are cutting of trees for charcoal making and for cooking; cutting trees for building construction and to harvest other wood products such as timber and poles used in the construction industry; environmental degradation due to wild forest fires. The proponent will therefore abide to this strategy by conserving tress and woodland forests surrounding the project.

3.4.13 National Climate Change Strategy (NCCS) – (2012)

The goal of this Strategy is to enable Tanzania to effectively adapt to and participate in global efforts to mitigate to climate change with a view to achieving sustainable economic growth in the context of the Tanzania's national development blueprint, Vision 2025; Five Years National Development plan;

and national cross sectoral policies. To achieve the stated goal, the following specific objectives have been set.

- To build the capacity of Tanzania to adapt to climate change impacts.
- To enhance resilience of ecosystems to the challenges posed by climate change.
- To enable accessibility and utilization of the available climate change opportunities.
- To enhance participation in climate change mitigation activities that lead to sustainable development.
- To enhance public awareness on climate change.
- To strengthen information management on climate change.
- To enhance institutional arrangements to adequately address climate change and
- To enhance mobilization of resources in particular finance to address climate change.

Design and implementation of the drilled boreholes and construction of water supply schemes shall include climate change adaptation measures for infrastructural resilience to climate change.

3.5 International Agreements, Conventions and Treaties

3.5.1 Africa Convention on the Conservation and Natural Resource (1968)

This convention intends to promote conservation efforts by requiring contracting States to adopt the measures necessary to ensure conservation, utilization and development of soil, water, flora and fauna resources in accordance with scientific principles and with due regard to the best interests of the people. The proponent will support Tanzania's commitment by promoting conservation efforts in all of its operations.

3.5.2 The Minimum Age Convention (No. 138) (1973)

The present report form is for the use of countries which have ratified the Convention. It has been approved by the Governing Body of the International Labour Office, in accordance with article 22 of the ILO Constitution, which reads as follows: "Each of the Members agrees to make an annual report to the International Labour Office on the measures which it has taken to give effect to the provisions of the Conventions to which it is a party. These reports shall be made in such form and shall contain such particulars as the Governing Body may request." The Government may deem it useful to consult the appended text of the Minimum Age Recommendation, 1973 (No. 146), the provisions of which supplement the present Convention and can contribute to a better understanding of its requirements and facilitate its application.

Article 1

Each Member for which this Convention is in force undertakes to pursue a national policy designed to ensure the effective abolition of child labour and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons.

Article 2

1. Each Member which ratifies this Convention shall specify, in a declaration appended to its ratification, a minimum age for admission to employment or work within its territory and on means of transport registered in its territory; subject to Articles 4 to 8 of this Convention, no one under that age shall be admitted to employment or work in any occupation. 2. Each Member which has ratified

this Convention may subsequently notify the Director General of the International Labour Office, by further declarations, that it specifies a minimum age higher than that previously specified. 3. The minimum age specified in pursuance of paragraph 1 of this Article shall not be less than the age of completion of compulsory schooling and, in any case, shall not be less than 15 years. 4. Notwithstanding the provisions of paragraph 3 of this Article, a Member whose economy and educational facilities are insufficiently developed may, after consultation with the organizations of employers and workers concerned, where such exist, initially specify a minimum age of 14 years. 5. Each Member which has specified a minimum age of 14 years in pursuance of the provisions of the preceding paragraph shall include in its reports on the application of this Convention submitted under article 22 of the Constitution of the International Labour Organization a statement: (a) that its reason for doing so subsists; or (b) that it renounces its right to avail itself of the provisions in question as from a stated date.

Article 3

1. The minimum age for admission to any type of employment or work which by its nature or the circumstances in which it is carried out is likely to jeopardize the health, safety or morals of young persons shall not be less than 18 years. 2. The types of employment or work to which paragraph 1 of this Article applies shall be determined by national laws or regulations or by the competent authority, after consultation with the organizations of employers and workers concerned, where such exist. 3. Notwithstanding the provisions of paragraph 1 of this Article, national laws or regulations or the competent authority may, after consultation with the organizations of employers and workers concerned, where such exist, authorize employment or work as from the age of 16 years on condition that the health, safety and morals of the young persons concerned are fully protected and that the young persons have received adequate specific instruction or vocational training in the relevant branch of activity. The proponent shall ensure no child is employed to do any of its activities.

3.5.3 The Basel Convention (1989)

The Basel Convention deals with the control of transboundary movement of hazardous wastes and their disposal. It provides obligations for State Parties with a view to: (a) reducing trans-boundary movements of wastes subject to the Basel Convention to a minimum consistent with the environmentally sound and efficient management of such wastes, (b) minimizing the amount and toxicity of hazardous wastes generated and ensuring their environmentally sound management (including disposal and recovery operations) as close as possible to the source of generation; (c) assisting developing countries in environmentally sound management of the hazardous and other wastes they generate. Developer will not transfer hazardous wastes it generates to nearby countries.

3.5.4 The International Labour Organization (ILO) Labour Convention

International labour standards are legal instruments drawn up by the ILO's constituents (governments, employers and workers) and setting out basic principles and rights at work. They are either Conventions (or Protocols), which are legally binding international treaties that may be ratified by member states, or Recommendations, which serve as non-binding guidelines.

The ILO Governing Body had initially identified eight "fundamental" Conventions, covering subjects that were considered to be fundamental principles and rights at work: freedom of association and the effective recognition of the right to collective bargaining; the elimination of all forms of forced or

compulsory labour; the effective abolition of child labour; and the elimination of discrimination in respect of employment and occupation. These principles were also covered by the ILO Declaration on Fundamental Principles and Rights at Work (1998). Following the adoption of the Protocol of 2014 to the Forced Labour Convention, 1930, a ninth ILO instrument was then considered as "fundamental". At the 110th Session of the International Labour Conference in June 2022, the ILO adopted a Resolution on the inclusion of a safe and healthy working environment in the ILO's framework of fundamental principles and rights at work. As a result, the ILO Declaration on Fundamental Principles and Rights at Work, 1998, has been amended to this effect and the Occupational Safety and Health Convention, 1981 (No. 155) and the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) are now considered as fundamental Conventions within the meaning of the 1998 Declaration, as amended in 2022. The eleven fundamental instruments therefore are Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87), Right to Organize and Collective Bargaining Convention, 1949 (No. 98); Forced Labour Convention, 1930 (No. 29) (and its 2014 Protocol); Abolition of Forced Labour Convention, 1957 (No. 105); Minimum Age Convention, 1973 (No. 138); Worst Forms of Child Labour Convention, 1999 (No. 182); Equal Remuneration Convention, 1951 (No. 100); Discrimination (Employment and Occupation) Convention, 1958 (No. 111); Occupational Safety and Health Convention, 1981 (No. 155); and Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187).4 This EIA has assessed these provisions and developer shall comply with them.

3.5.5 The Universal Declaration of Human Rights (1948)

The declaration proclaims a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.41 The declaration (UDHR) further states clearly that, all human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood. It further declares that, "everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, whether it is independent, trust, non-self-governing or under any other limitation of sovereignty.

The declaration (UDHR) has declared universally that "everyone has the right to work, to free choice of employment, to just and favorable conditions of work and to protection against unemployment. Everyone, without any discrimination, has the right to equal pay for equal work. Everyone who works has the right to just and favorable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection. Everyone has the right to form and to join trade unions for the protection of his interests." Even though the Universal Declaration of Human Rights of 1948 not formally by itself legally binding, the Declaration has been adopted in or influenced United Republic of Tanzania, wherein the government commit itself and its people to progressive measures to secure the universal and effective recognition and observance of the human rights set out in the Declaration. Thus, the declaration is obviously a

fundamental document of the United Nations and a powerful tool when applying diplomatic and moral pressure to governments that violates and of its provisions.

3.6 Administrative/Institutional Framework

3.6.1 Overall Management Responsibility

The institutional arrangement for environmental management in Tanzania is well spelt out in the EMA (2004). There are seven (7) institutions mentioned by the act, of which the Minister Responsible for the Environment is the overall in-charge for administration of all matters relating to the environment. Part III, Section 13(1) of EMA (2004) states that the Minister responsible for environment shall be in overall charge of all matters relating to the environment and shall in that respect be responsible for articulation of policy guidelines necessary for the promotion, protection and sustainable management of environment in Tanzania. The legal institutions for environmental management in the country include;

- Minister responsible for Environment;
- National Environmental Advisory Committee
- Department of Environment;
- National Environment Management Council (NEMC);
- Sector Ministries;
- Regional Secretariat;
- Local Government Authorities (City, Municipal, District, Township, Ward, Village, sub-village "Kitongoji").

3.6.2 Minister Responsible for Environment

The Minister is responsible for matters relating to environment, including giving policy guidelines necessary for the promotion, protection and sustainable management of the environment in Tanzania. The Minister approves an EIA and may also delegate the power of approval for an EIA to the DOE, Local Government Authorities or Sector Ministries. The Minister also:

- Prescribes (in the regulations) the qualifications of persons who may conduct an EIA;
- Reviews NEMC reports on the approval of an EIA;
- Issues an EIA certificate for projects subject to an EIA;
- Suspends an EIA certificate in case of non-compliance.

3.6.3 National Environmental Advisory Committee

The National Advisory Environmental Committee is comprised of members with experience in various fields of environmental management in the public and private sector and in civil society. The committee advises the Minister on any matter related to environmental management. Other functions include:

- Examine any matter that may be referred to it by the Minister or any sector Ministry relating to the protection and management of the environment;
- Review and advice the Minister on any environmental plans, environmental impact assessment of major projects and activities for which an environmental impact review is necessary;
- Review the achievement by the NEMC of objectives, goals and targets set by the Council and advise the Minister accordingly;

- Review and advise the Minister on any environmental standards, guidelines and regulations;
- Receive and deliberate on the reports from Sector Ministries regarding the protection and management of the environment;
- Perform other environmental advisory services to the Minister as may be necessary.

3.6.4 Division of Environment

The Division of Environment (DoE) is placed in the Vice-President's Office. The functions of the Division of Environment include:

- Coordination of various environmental management activities undertaken by other agencies;
- Promotion of the integration of environmental considerations into development policies, plans, programmes, strategies, projects;
- Undertaking strategic environmental assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of quality of human life in Tanzania;
- Advise the Government on legislative and other measures for the management of the environment or the implementation of the relevant international environmental agreements in the field of environment;
- Monitoring and assessing activities undertaken by relevant Sector Ministries and agencies;
- Preparation and issuing of reports on the state of the environment in Tanzania through relevant agencies;
- Coordination of issues relating to articulation and implementation of environmental management aspects of other sector policies and the National Environment Policy.

3.6.5 National Environment Management Council (NEMC)

The NEMC's purpose and objective is to undertake enforcement, compliance, review and monitoring of EIA's and to facilitate public participation in environmental decision-making. According to the Environmental Management Act (2004) the NEMC has the following responsibility pertaining to EIA in Tanzania:

- Registers experts and firms authorized to conduct EIA;
- Registers projects subject to EIA;
- Determines the scope of the EIA;
- Set-ups cross-sectoral Technical Advisory Committee (TAC) to advise on EIA reviews;
- Requests additional information to complete the EIA review;
- Assesses and comments on EIA, in collaboration with other stakeholders,
- Convenes public hearings to obtain comments on the proposed project;
- Recommends to the Minister to approve, reject, or approve with conditions specific EIS;
- Monitors the effects of activities on the environment;
- Controls the implementation of the Environmental Management Plan (EMP);
- Makes recommendations on whether to revoke EIA Certificates in case of non-compliance;
- Promotes public environmental awareness;
- Conducts Environmental Audits.

3.6.6 Sector Ministries

The existing institutional and legal framework the Sector Ministries are required to establish Sector Environmental Sections headed by the Sector Environmental Coordinator. The Sector Ministries' Environmental Sections:

- Ensure environmental compliance by the Sector Ministry;
- Ensure all environmental matters falling under the sector ministry are implemented and report of their implementation is submitted to the DOE;
- Liaise with the DoE and the NEMC on matters involving the environment and all matters with respect to which cooperation or shared responsibility is desirable or required;
- Ensure that environmental concerns are integrated into the ministry or departmental development planning and project implementation in a way which protects the environment;
- Evaluate existing and proposed policies and legislation and recommend measures to ensure that those policies and legislation take adequate account of effect on the environment;
- Prepare and coordinate the implementation of environmental action plans at national and local levels;
- Promote public awareness of environmental issue through educational programmes and dissemination of information;
- Refer to the NEMC any matter related to the environment;
- Undertake analysis of the environmental impact of sectorial legislation, regulation, policies, plans, strategies and programmes through strategic environmental assessment (SEA);
- Ensure that sectorial standards are environmentally sound;
- Oversee the preparation and implementation of all EIA's required for investments in the sector;
- Ensure compliance with the various regulations, guidelines and procedures
- Issued by the Minister responsible for the environment and;
- Work closely with the ministry responsible for local government to provide environmental advice and technical support to district level staff working in the sector.

3.6.7 Regional Secretariat

The Regional Secretariat, which is headed by the Regional Administrative Secretary under which there is a Regional Environmental Management Expert, who is responsible for the co-ordination of all environmental management programmes in their respective regions. The Regional Environmental Expert thus:

- Advises local authorities on matters relating to the implementation of and enforcement of environmental laws and regulations;
- Creates a link between the region and the DOE and the Director General of the NEMC.

3.6.8 Local Government Authorities

Under the Local Government Act of 1982 (Urban and District Authorities), Local Government Authorities include the City Councils, Municipal Councils, District Councils, Town Councils, Township, Mtaa, Ward, and Village. The Environmental Management Committee of each jurisdiction includes:

- Initiating inquiries and investigations regarding any allegation related to the environment and implementation of or violation of the provisions of the Environmental Management Act;

- Requesting any person to provide information or explanation about any matter related to the environment;
- Resolving conflicts among individual persons, companies, agencies non-governmental organizations, government departments or institutions about their respective functions, duties, mandates, obligations or activities;
- Inspecting and examines any premises, street, vehicle, aircraft or any other place or article which it believes, or has reasonable cause to believe, that pollutant or other articles or substances believed to be pollutant are kept or transported;
- Requiring any person to remove such pollutants at their own cost without causing harm to health and;
- Initiating proceedings of civil or criminal nature against any person, company, agency, department or institution that fails or refuses to comply with any directive issued by any such Committee.
- Under the Environmental Management Act (2004), the City, Municipal, District and Town Councils are headed by Environmental Management Officers who are responsible for environmental matters. The functions of the Officers are to:
- Ensure enforcement of the Environmental Management Act in their respective areas;
- Advice the Environmental Management Committee on all environmental matters;
- Promote awareness in their areas on the protection of the environment and conservation of natural resources;
- Collect and manage information on the environment and the utilization of natural resources;
- Prepare periodic reports on the state of the local environment;
- Monitor the preparation, review and approval of EIA's for local investors;
- Review by-laws on environmental management and on sector specific activities related to the environment;
- Report to the DoE and NEMC on the implementation of the Environmental Management Act and;
- Perform other functions as may be assigned by the local government authority from time to time

CHAPTER FOUR

4.0 ENVIRONMENTAL BASELINE INFORMATION

4.1 Introduction

This chapter provides baseline information on the existing physical, biological and socio-economic conditions in the project area. This baseline information is used as a benchmark to identify and determine the level of potential impact due to the project activities at all phases. This data has to be considered in planning of the monitoring and mitigation requirements. The major purposes of describing the environmental settings of the study area are:

- To assess the existing environmental quality, as well as the environmental impacts of the proposed developments being studied.
- To identify environmentally significant factors that could preclude any future development.
- Additionally, to provide sufficient information so that decision makers to be familiar with the general information this can develop common understanding of the project.

4.2 Methodology of conducting baseline study

The baseline information was collected from primary and secondary data sources. Primary information was collected through field study, field measurements, consultations, and satellite images. The secondary information was collected from published journals, books, authorized websites, government reports and previous studies carried out by other researchers. Various components have been studied as a part of the baseline study these are:

- Physical Environment
- Air Environment
- Noise Environment
- Water Environment
- Socio-Economic Environment

4.3 Biophysical Environment

4.3.1 Climatic Condition

4.3.1.1 Temperature

The Morogoro District Council climate varies from semi and warm tropical to cool high altitude tropical. The altitudes range from 300 – 2300 meters above sea level and mean monthly temperature is 26^{o}C (Socio-economic profile of MDC, 2018).

4.3.1.2 Rainfall

Rainfall is unimodal, with short rain season in October to December and long rain season in March – May every year. Rainfall ranges between 700mm in lowland areas to 2300mm in high altitudes and adjacent areas (Socio-economic profile of MDC, 2018).

4.3.2 Topography and Landscape

Geographically, Morogoro District Council lies on the three ecological zones which are mountainous areas, low mountainous zones and savannah zones. Mountainous area takes the large part of Uluguru Mountains. Low Mountainous zones takes the biggest part of the area towards north, it ranges from 600m to 1200mm from sea level. Savannah zones are larger than all other area; it occupies 55% of the whole area of Morogoro District (Socio-economic profile of MDC, 2018).

4.3.3 Vegetation

The proposed sites village vegetation is characterized with small to large trees and bushes. Within the project boundary areas there are no endangered or sensitive tree species (Socio-economic profile of MDC, 2018).

4.3.4 Geology

The Morogoro District has several varieties of stones found in all divisions which are characterized by hardness, brittle and color. Groundwater occurrence is largely limited to secondary features such as weathered zones, joints or faults. The potential of weathered zones depends on the degree and depth of saturation and associated fracturing. Review made from previous data of drilled boreholes on correlation from geological logs for the few boreholes drilled nearby the surveyed area shows that superficial sand and clayey sands are present even at shallow depths. Thus, semi consolidated sand and weathered rocks are the expected aquifers in the surveyed area. However, the actual quality and quantity of water will be determined after drilling. Groundwater occurrence in this formation is largely limited to secondary features such as weathered or fractured zones; joints or faults. The potential of weathered zones depends on the degree and depth of saturation and associated fracturing (Socio-economic profile of MDC, 2018).

4.3.5 Surface water sources

The Morogoro Council District is very potential for aquaculture because there are many rivers, streams and springs where water can be obtained for the purpose. In most cases the suitable areas for aquaculture can be located in up lands because the lowlands are affected by floods during rainy seasons. Physical constructed ponds need to be well designed to avoid any environmental degradation (Socio-economic profile of MDC, 2018).

4.3.5.1 Hydrological and geophysical survey

Major aquifers in the area under study are weathered to fractured granites and gneisses to the deep wells and coarse sand with gravels in shallow to medium wells. Groundwater movement assumes the topography and recharge is by rain water infiltration through the superficial loose sand formation, weathered rocks and fractures (WRBWB, 2022). Groundwater occurrence is largely limited to secondary features such as weathered zones, joints or faults. The potential of weathered zones depends on the degree and depth of saturation and associated fracturing (WRBWB, 2022).

Review made from previous data of drilled boreholes on correlation from geological logs for the few boreholes drilled nearby the surveyed area shows that superficial sand and clayey sands are present even at shallow depths. Thus, semi consolidated sand and weathered rocks are the expected aquifers in the surveyed area. However, the actual quality and quantity of water will be determined after drilling (WRBWB, 2022). Prior to carrying out the geophysical investigation surveys, reconnaissance survey was conducted in order to have general understanding of hydrogeological and geophysical knowledge of the study area. During reconnaissance survey, the valley flows high elevations originating downward of the Udzungwa Mountains. The approach was such that potential sites with deep, potential fracture zones were selected. Inspection of groundwater potential sites was done and geophysical surveys were conducted in areas favorable from both Geological/hydro geological point of view (WRBWB, 2022).

Geological survey; aimed at identifying the visible surface geology of the area and its surrounding, including identification of topography, physical features, soil type, vegetation and drainage, rocky outcrops, strike/dip of rocks etc. Geological survey helps to provide a model of historical development of a particular area with respect to geological time (WRBWB, 2022). The geophysical survey was done using Magnetometer and ABEM SAS 4000 machine which measures and records digital values of resistivity in ohm meter (WRBWB, 2022).

4.3.5.1.1 Magnetic Method

The profiling method was conducted using Magnetometer, so as to outlines the weak points such as fractured, weathered zones which are potential area for groundwater flows. Figure 3-1 shows experts conducting geophysical survey using magnetometer (WRBWB, 2022).

4.3.5.1.2 Vertical electrical Sounding Method

Vertical electrical sounding 'VES' (Schlumberger protocol). SAS 4000 resistivity Meter was applied in making measurements for determining depth of the bed rock, to establish the thickness of the aquifer material/ weathering and recommend the depth of the borehole to be drilled (WRBWB, 2022).

For resistivity-Hydrogeological studies VES sounding obtained using the Ohm resistivity meter commonly with the Schlumberger configuration (A-M-N-B), the distance between potential electrodes MN was gradually increased in steps starting from 0.5m to 25m according to the geometrical factor (K) for the Schlumberger configuration to obtain a measurable potential difference. The half current electrodes separation (AB/2) was usually increased in steps starting from 1 to 180m depending on the required depth of penetration.

The distance between potential electrodes MN was gradually increased in steps starting from 0.5m to 25m according to the geometrical factor (K) for the Schlumberger configuration to obtain a measurable potential difference. The half current electrodes separation (AB/2) was usually increased in steps starting from 1 to 180m depending on the required depth of penetration. The results were further refined by computer interpretation method using EARTH IMAGER software.

The Sounding technique was carried out in the identified points from the horizontal profiling, aiming to investigate the geological and hydrogeological situation of the subsurface formations in the area. The measurements were made by using Schlumberger electrode configuration. The VES probed in the study area, the maximum separation of half current electrode AB/2 set to 150m. Potential electrodes MN/2 were separated according to the Schlumberger configuration at intervals of 0.5m, 2.5m, 5m, 10m and 25m.

4.3.5.2 Geological survey

The geology of the area is characterized by Neo Proterozoic Orogen, the Pan African Mozambique belt and the major rock types are high pressure granulites, deformed biotite-hornblende gneisses and migmatities largely derived from granitoid precursors, marbles, amphibolites, and post-kinematic granitoids and pegmatites. Groundwater occurrence in this formation is largely limited to secondary features such as weathered or fractured zones; joints or faults. The potential of weathered zones depends on the degree and depth of saturation and associated fracturing.

Correlation from geological logs for the few boreholes drilled in the close vicinity of the mentioned surveyed areas, show that superficial sand and clayey sands are present even at shallow depths. Thus, semi consolidated sand and weathered or fractured rocks are the expected aquifers in the surveyed area. Some boreholes yield plenty but saline water anticipated due to presence of saline rock on that area. However, the actual quality and quantity of water will be determined only during or after drilling.

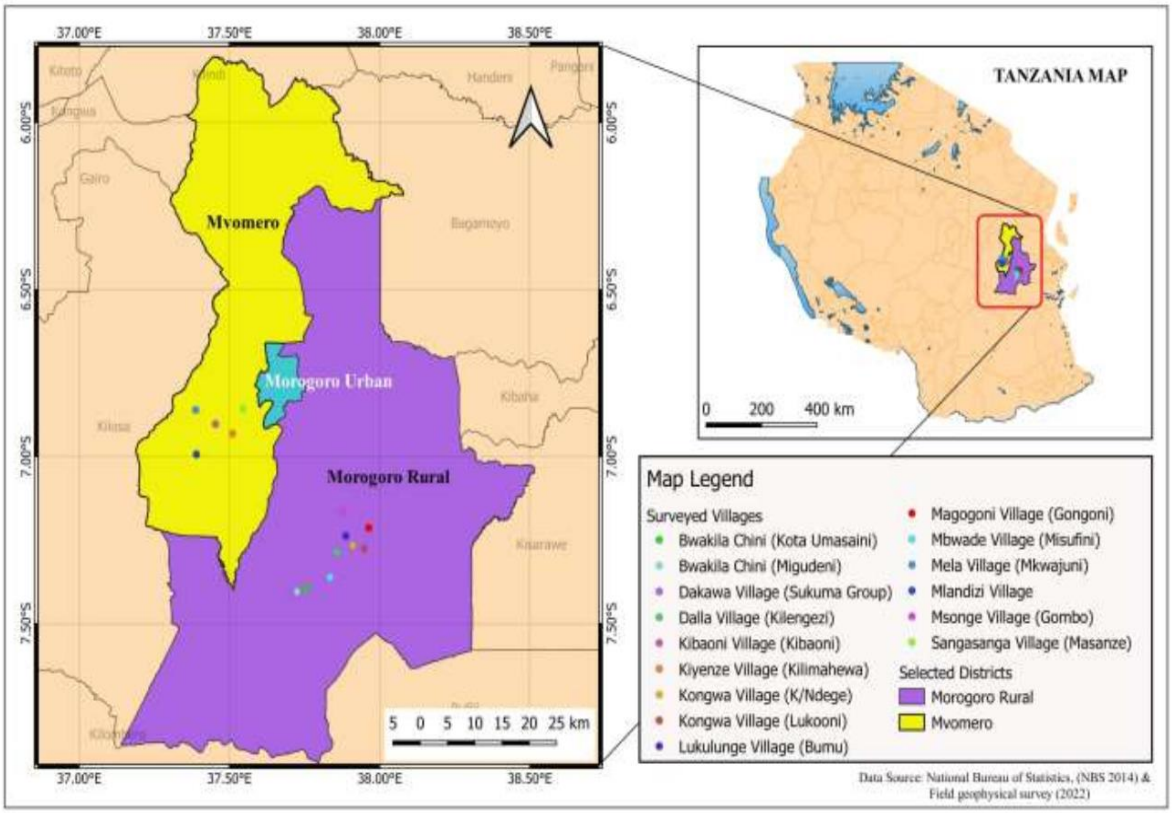

Figure 5: Morogoro Map Showing Surveyed Points
Source: WRBWB, 2022

4.3.6 Soils

The common types of soil found in the Morogoro District are clay, clay loamy, loamy sands, sand, sand clay loams and Reddish sandy clays to clays. Different locations are characterized with certain type of soil (Socio-economic profile of MDC, 2018).

4.4 Social Economic environment

4.4.1 Land use

In Morogoro district land is used for farming, settlements, and water bodies. Some lands have special use; for instance, planned areas for livestock grazing, while others have multiple uses like mixed farming, catchment area and settlements with numerous functions (Socio-economic profile of MDC, 2018).

4.4.2 Population

According to 2022 Population and Housing Census report, the Morogoro district had total population of 387,736 people, while the population of Bwakila chini ward is 31,419 people (NBS, 2022). The age-sex ratio and age sex distribution for Morogoro district is shown in **Table 6** (NBS, 2022).

Table 6: Population Distribution by Age, Sex and Place of Residence in Morogoro District, 2022 PHC

Age	Total			Rural			Urban		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Total	**387,736**	**192,252**	**195,484**	**333,825**	**166,014**	**167,811**	**53,911**	**26,238**	**27,673**
0	10,713	5,284	5,429	9,124	4,480	4,644	1,589	804	785
1	9,889	4,981	4,908	8,438	4,252	4,186	1,451	729	722
2	10,479	5,269	5,210	9,033	4,533	4,500	1,446	736	710
3	11,132	5,586	5,546	9,652	4,820	4,832	1,480	766	714
4	11,748	5,964	5,784	10,120	5,153	4,967	1,628	811	817
0 - 4	**53,961**	**27,084**	**26,877**	**46,367**	**23,238**	**23,129**	**7,594**	**3,846**	**3,748**
5	11,054	5,648	5,406	9,632	4,943	4,689	1,422	705	717
6	10,271	5,118	5,153	8,951	4,458	4,493	1,320	660	660
7	10,565	5,398	5,167	9,185	4,699	4,486	1,380	699	681
8	10,689	5,381	5,308	9,253	4,643	4,610	1,436	738	698
9	10,343	4,983	5,360	8,975	4,314	4,661	1,368	669	699
5 - 9	**52,922**	**26,528**	**26,394**	**45,996**	**23,057**	**22,939**	**6,926**	**3,471**	**3,455**
10	10,216	5,503	4,713	8,913	4,810	4,103	1,303	693	610
11	8,956	4,646	4,310	7,810	4,060	3,750	1,146	586	560
12	11,325	5,982	5,343	9,846	5,205	4,641	1,479	777	702
13	9,319	4,821	4,498	8,126	4,228	3,898	1,193	593	600
14	9,723	5,223	4,500	8,360	4,560	3,800	1,363	663	700
10 - 14	**49,539**	**26,175**	**23,364**	**43,055**	**22,863**	**20,192**	**6,484**	**3,312**	**3,172**
15	7,650	4,136	3,514	6,587	3,601	2,986	1,063	535	528
16	7,279	3,917	3,362	6,174	3,360	2,814	1,105	557	548
17	6,912	3,876	3,036	5,894	3,354	2,540	1,018	522	496
18	6,930	3,693	3,237	5,877	3,177	2,700	1,053	516	537
19	5,578	2,796	2,782	4,728	2,397	2,331	850	399	451
15 - 19	**34,349**	**18,418**	**15,931**	**29,260**	**15,889**	**13,371**	**5,089**	**2,529**	**2,560**
20	7,511	3,516	3,995	6,370	3,025	3,345	1,141	491	650
21	4,561	2,079	2,482	3,826	1,754	2,072	735	325	410
22	7,825	3,627	4,198	6,593	3,069	3,524	1,232	558	674
23	5,410	2,459	2,951	4,494	2,086	2,408	916	373	543
24	4,751	2,167	2,584	3,934	1,816	2,118	817	351	466
20 - 24	**30,058**	**13,848**	**16,210**	**25,217**	**11,750**	**13,467**	**4,841**	**2,098**	**2,743**
25	6,815	3,279	3,536	5,724	2,772	2,952	1,091	507	584
26	4,942	2,322	2,620	4,064	1,904	2,160	878	418	460
27	5,179	2,456	2,723	4,327	2,057	2,270	852	399	453
28	5,739	2,691	3,048	4,770	2,246	2,524	969	445	524
29	4,453	2,049	2,404	3,695	1,693	2,002	758	356	402
25 - 29	**27,128**	**12,797**	**14,331**	**22,580**	**10,672**	**11,908**	**4,548**	**2,125**	**2,423**
30	7,718	3,562	4,156	6,505	3,019	3,486	1,213	543	670
31	3,268	1,604	1,664	2,715	1,336	1,379	553	268	285
32	6,292	3,090	3,202	5,261	2,606	2,655	1,031	484	547
33	3,605	1,718	1,887	3,014	1,460	1,554	591	258	333
34	3,890	1,926	1,964	3,248	1,620	1,628	642	306	336
30 - 34	**24,773**	**11,900**	**12,873**	**20,743**	**10,041**	**10,702**	**4,030**	**1,859**	**2,171**
35	5,996	2,942	3,054	5,178	2,533	2,645	818	409	409
36	4,185	1,976	2,209	3,545	1,685	1,860	640	291	349
37	3,805	1,796	2,009	3,191	1,497	1,694	614	299	315
38	4,781	2,226	2,555	4,096	1,916	2,180	685	310	375
39	2,968	1,405	1,563	2,490	1,173	1,317	478	232	246
35 - 39	**21,735**	**10,345**	**11,390**	**18,500**	**8,804**	**9,696**	**3,235**	**1,541**	**1,694**

Age	Total			Rural			Urban		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
40	6,407	3,038	3,369	5,482	2,579	2,903	925	459	466
41	2,462	1,219	1,243	2,110	1,038	1,072	352	181	171
42	4,764	2,401	2,363	4,086	2,061	2,025	678	340	338
43	2,959	1,486	1,473	2,529	1,282	1,247	430	204	226
44	2,613	1,293	1,320	2,241	1,103	1,138	372	190	182
40 - 44	**19,205**	**9,437**	**9,768**	**16,448**	**8,063**	**8,385**	**2,757**	**1,374**	**1,383**
45	4,752	2,454	2,298	4,162	2,137	2,025	590	317	273
46	2,664	1,339	1,325	2,310	1,165	1,145	354	174	180
47	2,760	1,390	1,370	2,384	1,197	1,187	376	193	183
48	3,541	1,814	1,727	3,061	1,549	1,512	480	265	215
49	2,384	1,176	1,208	2,052	1,015	1,037	332	161	171
45 - 49	**16,101**	**8,173**	**7,928**	**13,969**	**7,063**	**6,906**	**2,132**	**1,110**	**1,022**
50	4,848	2,326	2,522	4,239	2,021	2,218	609	305	304
51	1,568	789	779	1,388	706	682	180	83	97
52	3,518	1,819	1,699	3,096	1,597	1,499	422	222	200
53	1,793	899	894	1,571	779	792	222	120	102
54	2,235	1,115	1,120	1,986	997	989	249	118	131
50 - 54	**13,962**	**6,948**	**7,014**	**12,280**	**6,100**	**6,180**	**1,682**	**848**	**834**
55	2,487	1,279	1,208	2,232	1,158	1,074	255	121	134
56	2,193	1,121	1,072	1,951	990	961	242	131	111
57	1,742	852	890	1,559	754	805	183	98	85
58	2,282	1,131	1,151	2,008	1,003	1,005	274	128	146
59	1,500	777	723	1,328	676	652	172	101	71
55 - 59	**10,204**	**5,160**	**5,044**	**9,078**	**4,581**	**4,497**	**1,126**	**579**	**547**
60	3,505	1,554	1,951	3,107	1,379	1,728	398	175	223
61	1,573	869	704	1,379	765	614	194	104	90
62	2,453	1,179	1,274	2,184	1,050	1,134	269	129	140
63	1,354	687	667	1,192	606	586	162	81	81
64	1,392	742	650	1,239	660	579	153	82	71
60 - 64	**10,277**	**5,031**	**5,246**	**9,101**	**4,460**	**4,641**	**1,176**	**571**	**605**
65	2,055	908	1,147	1,848	817	1,031	207	91	116
66	923	459	464	818	409	409	105	50	55
67	1,180	509	671	1,070	461	609	110	48	62
68	1,544	734	810	1,389	661	728	155	73	82
69	771	391	380	691	350	341	80	41	39
65 - 69	**6,473**	**3,001**	**3,472**	**5,816**	**2,698**	**3,118**	**657**	**303**	**354**
70	2,769	1,146	1,623	2,507	1,036	1,471	262	110	152
71	606	335	271	540	300	240	66	35	31
72	1,538	704	834	1,403	646	757	135	58	77
73	639	346	293	583	318	265	56	28	28
74	751	395	356	677	354	323	74	41	33
70 - 74	**6,303**	**2,926**	**3,377**	**5,710**	**2,654**	**3,056**	**593**	**272**	**321**
75	1,343	577	766	1,221	538	683	122	39	83
76	640	319	321	590	296	294	50	23	27
77	721	328	393	644	287	357	77	41	36
78	794	340	454	708	305	403	86	35	51
79	369	163	206	335	145	190	34	18	16
75 - 79	**3,867**	**1,727**	**2,140**	**3,498**	**1,571**	**1,927**	**369**	**156**	**213**
80+	**6,879**	**2,754**	**4,125**	**6,207**	**2,510**	**3,697**	**672**	**244**	**428**

Source: NBS, 2022

4.4.3 Ethnic groups

The indigenous people of Morogoro district are of Bantu origin. The dominant tribes in the District are Luguru, Kutu, Pogoro, Ndanba, Ngindo, and Sagara. Pastoralists are present mainly being Masai and Sukuma tribes. Most of dwellers tend to concentrate in mountainous areas (Socio-economic profile of MDC, 2018).

4.4.5 Pastoralism sector

The livestock sector makes significant contribution to food security and poverty alleviation at household level. Besides, the subsector is an important source of protein through meat, milk and poultry products. Livestock is the second important economic activity for the residents of Morogoro District. To large extent livestock keeping is predominantly traditional and involves mostly indigenous cattle. Type of livestock kept are t include Cattle, Goat, Sheep, Donkey, Pig and chicken (Socio-economic profile of MDC, 2018).

4.4.6 Agricultural sector

Agriculture sector mainly uses land resource. In Morogoro district five land use types are identified as a basis for characterizing and evaluating village land and the uses to which it may be put. The analysis conducted is based on the site and socio-economic conditions within which the industry operates. It is worth emphasizing here that more than one land use is practiced in one enterprise, though not in one spatial continuum. The major land use types are: Smallholder rain-fed arable farming and improved traditional technology based on crop mixture of millet/ sorghum/maize/ cassava combined with legumes (beans, pigeon peas) with or without livestock, Smallholder rain-fed arable farming and improved traditional technology based on rice and sugarcane, Smallholder rain-fed arable farming and intermediate technology based on maize, (cotton and sunflower), vegetables with or without livestock Smallholder livestock keeping and improved traditional breeds, namely cattle, goats, sheep, donkeys, and poultry, all based on ranges (agro-pastoralism), Smallholder livestock production based on improved traditional pig farming (Socio-economic profile, MDC, 2018).

4.4.7 Employment Status

In Morogoro district, the high number of people is self-employed in agriculture sector, livestock keeping and grazing and entrepreneurship (Socio-economic profile of MDC, 2018).

4.4.8 Roads

The project sites are well connected and accessible through the Old Dar es Salaam Road from Morogoro town, then Kiroka - Kibangile road, then Lumbu - Matombo Road and finally Matombo - Dalla Road. Therefore, the project is well located adjacent to important roads for easily accessible for any people involving in social economic activities (Socio-economic profile of MDC, 2018).

4.4.9 Communication Networks

Morogoro district has well defined communication networks. The companies which provide communication network in the district are TTCL (Tanzania Telecommunication Company Limited). Mobile telephone services such as Vodacom, Airtel, Halotel and Tigo are available at the project villages (Socio-economic profile of MDC, 2018).

4.4.10 Water Supply

In the proposed sites in Morogoro district, water is supplied by RUWASA. RUWASA will also be responsible in running and supervising the project during the operation phase (Socio-economic profile of MDC, 2018).

4.4.11 Energy

Morogoro district obtain its power from the National grid. However, firewood, kerosene and charcoal stoves continued to be the main energy sources for cooking specially in the rural areas at the proposed sites. At the proposed site there is TANESCO transmission line (3 phase), but the proponent intends to use solar energy instead.

4.4.12 Waste Management

Most people in Morogoro district uses traditional pit latrine as main type of toilet facility and only few uses Ventilated Improved Pit Latrines. In most rural areas, people with no toilets use haphazardly open areas for defecation. Solid waste disposal in the area is the responsibility of the council, which collects and transfer waste to the designated dumpsite. In some rural areas, solid wastes are burned or buried in pits.

CHAPTER FIVE

5.0 STAKEHOLDERS ENGAGEMENT AND PUBLIC CONSULTATION

5.1 Introduction

This Chapter discusses the methods used to identify and engage the identified stakeholders, as well as comments from stakeholders on the possible impacts of the project. The information offered here is the outcome of interviews conducted by the Beyond Nature Limited team of experts with stakeholders about the project's operation. In response to the requirement for stakeholder comments, this activity was carried out to identify important environmental and social issues and concerns about the proposed project's development. Stakeholders were primarily responsible for providing critical baseline and comprehensive information that was utilized to complete the ESIA report.

Specifically, the issues, questions, and concerns of stakeholders were considered during the Environmental and Social Impact Assessment research. The expert team assisted in clarifying critical factors about the social and economic elements of the proposed project from the local to the district level. Stakeholder input and recommendations were gathered through a review of documented material and a communication process with affected parties.

5.2 Objectives stakeholder's engagement and consultations

Objectives of public consultations and engagement for the proposed project are:

- Provide clear and accurate information about the project to the communities.
- Disseminate information to affected stakeholders to raise their awareness of the proposed project.
- Increase stakeholder understanding about the proposed project, including its context, aims, opportunities and constraints.
- Accumulate feedback from affected stakeholders to inform project development and ensure that outcomes appropriately meet the relevant needs of those concerned.

Consultation seeks to:

- Document stakeholders' concerns and preferences;
- Identify any issues and constraints existing in the project's areas which may affect the design
- Assess and document the commonality and relevance of issues and concerns identified through the consultation to feed the ESIA process.
- Gather opinions and suggestions directly from the communities on their preferred mitigation measures.

5.3 Approaches to stakeholders' engagement

The ESIA team prepared for stakeholders' engagement (SE) prior to the actual site visit. They prepared a stakeholders' engagement plan in which they identified individuals, organizations, governmental institution, and indigenous group from various government administrative levels. The team outlined the environmental and social entities that could be impacted by the Water Sector Support Programme Phase II (WSSP II) project to be considered during the activities such as land use, vegetation, crops, livestock etc. that will be affected by the scope of the project. The ESIA team determined the methodology and technique that will be used with each stakeholder.

5.3.1 Methodology

Observation, major Key Informant Interviews (KIIs), and Focus Group Discussions (FGDs) with stakeholders were done as part of a hybrid strategy that combines desk review with qualitative data gathering methods for identifying major concerns. For the purpose of choosing KIIs, purposive sampling was utilized in the activity. The KIIs featured a discussion between the consulting expert team and a team of local experts and professionals with first-hand knowledge of the community. Due to the fact that every person of the community had an equal chance of being included in the sample during the stakeholder engagement activity, the later team used probability sampling approaches for the FGDs. Community level engagements were also made possible through public meetings with villagers during the field visits which were conducted in the project villages and the area of influence.

5.3.2 Stakeholders Identification

TANROADS, TARURA, TANESCO, RUWASA, FIRE AND RESCUE FORCES, WRBWB, Wards and village committees, and community groups just to mention a few are among others, the identified stakeholders for consultation.

5.3.3 Stakeholders Analysis

The principles and ground rules guiding the engagement with local communities and the program for consultation to ensure timely notification of consultation activities were made. **Table 7** and **Table 8** show a list of identified and analyzed stakeholders and their responsibilities.

Table 7: The list of identified and analyzed stakeholders

LEVEL	STAKEHOLDERS
Community members level	Indigenous people in each ward and village of the proposed project.
Village and ward level	Village development councils (VDCs), Village executive officers (VEOs), Ward executive officers (WEOs)
District Level	District Executive Director (DED)
	District Administrative Secretary (DAS)
	District Council Management team (DEMO, SLO, LO, DLO, DPLO etc.)
	TARURA
	RUWASA
Regional level	TANROADS
	TANESCO
	FIRE AND RESCUE FORCES
	WAMI/RUVU BASIN WATER BOARD

Source: Consultant, 2023

Table 8: Sample distribution of stakeholders from district to community level

Level	Stakeholder	Specified area of interest	Remarks
Regional	TANROADS	Responsible for construction care and maintenance of regional roads, and supervision of carriage of loads on those roads	Will be consulted in regard to the transportation of heavy materials for boreholes drilling
	FIRE AND RESCUE FORCES	Provide consultation and guidance on fire and rescue measures.	The project will require consultation on fire-fighting equipment and rescue measures to be taken in case of fire incidents
	TANESCO	Responsible for generation, transmission, distribution and supply of electricity.	Since the project intends to use solar energy, TANESCO consultation is less required.
	WAMI/RUVU BASIN WATER BOARD	Responsible for protecting, assessment and monitoring of water resources in the basin.	Will be consulted on each step of the projects, on protection of water resources.
District	TARURA	Providing sustainable and cost-effective maintenance and development of Rural and Urban roads.	The project will require consultation from TARURA on the rural road's maintenance and capacity.
	RUWASA	Responsible for construction, supervising and regulating water supply services.	The project involves water supply services hence RUWASA will be consulted in each step of the project.
	DEMO	Overseeing environmental protection issues in the district	The project has environmental impacts hence, consultation is necessary.
	DAS/DC	Assisting RAS in administrative and human resources functions in the district.	Consultation required since the project involves and affect social and welfare of the communities in the district.
	DED	Advising the director in relation to budgetary processes, monitoring expenditures and providing division managers with advice and assistance with district's day-to-day expenditure reviews operations, finances, and human resources issues.	Since DED is directly responsible for overseeing and management of districts projects, consultation is necessary.
	Senior Livestock Officer (SLO)	Responsible for monitoring and supervising issues related to livestock keeping in the district.	The project shall consult SLO since water supply systems to will be used by livestock.
	Land Officer (LO)	Management of land uses issues in the district.	Will be consulted since land acquisition process is involved for construction.
	District Law Officer (DLO)	Supervising law issues in the entire district	Consultation is required since the land owners will be required to legally offer their land for construction activities.
Ward level	Ward offices	Government offices responsible for Ward administration, community development and social welfare	The ward offices will be consulted to gather information and views on socio economic aspect on the project area
Village level	Village offices	Government offices and community representation responsible for administration, community development and social welfare in the village.	Will be consulted in order to inform about the project and so as to seek their concerns regarding socio economic and environmental impacts that the project will have on them.
Community level	Community members from villages	Community members located in the area of the proposed project or in close proximity to the project area which may be directly or indirectly impacted	Will be consulted throughout the project's life to inform Them about the project and identify their concerns and suggestions and to provide feedback about their concerns.

Source: Consultant, 2023

5.3.4 Public meetings

Following international and national recommendations for performing ESIA, initial mapping of possible social and environmental concerns that may occur as a result of the project was done during meetings with community members and community groups as shown in **Figure 6**.

Figure 6: Public consultation with community members in Mvuha Ward

Source: Consultant, 2023

5.3.5 Consultative meetings with Districts' & Regional authorities and other stakeholders

Consultative meetings at Districts' and regional levels included discussions with Districts' Council Management Team (CMT) which comprises of technical staff from all departments. Stakeholders' meetings from other sectors included both managerial and technical staff. This involved individuals and stakeholder groups who in one way or another will be impacted by or be involved in the project and its associated activities. The aim was to assess attitude, perceptions and experiences of the social-economic impacts of the project. During this activity, Interviews were conducted at the Regional level, District level, and Institutional and Regulatory bodies, to the ward levels. These consultations provided useful information with their "expert" knowledge of the predicted positive and negative impacts of the project.

5.3.6 Concerns Raised by Stakeholder's

The stakeholders in the project area raised the following issues during Public Meeting and FGDs as it is described in the **Table 9**.

Table 9: Issues and concerns raised by stakeholders at Morogoro District council

No.	Name	Institution	Designation	Comments/Concerns	Response for Raised concerns
1	JANETH CHATT	DC office	Ag. District Administrative Secretary (DAS)	1. The project is welcomed at the district as it will have both social and economic benefits to the local communities and district as a whole. 2. The community should be made aware of the project in their areas. 3. Before any construction process to begin, the land owners must agree to offer their lands freely to their village government since there is no compensation,	ENG. KWAME MICHENJE Awareness meetings had already been done hence the people in the project areas are aware of the project, and the land owners of the project areas have already been identified and have all agreed to offer their lands to the local government for project implementation, signing of agreement forms will follow under the witness of District law officer.
2	EDWIN MASHALA	Morogoro DC	Ag. District Executive Director (DED)	1. The project is welcomed; it is advised that the community members should be well involved. 2. The land owners should legally agree to offer their lands for construction in presence of their local government leaders.	ENG. BIBIANA ABEL The public meetings shall be conducted in each project village, and the feasibility study had already been conducted and the land owners had agreed to offer their land to the local government for the purpose of construction. Our team will be accompanied by the district law officer to witness the agreement form signing with land owners.
3	ROSE SEMIONO	Morogoro DC	District Environmental Management Officer (DEMO)	1. Livestock keepers should be educated on the importance of preserving water resource by proper utilizing of the proposed project. 2. In order to reach the intended goal of preserving water resources, the environmental protection measures should be employed throughout the project.	JANETH KISOMA Community involvement will be done in all villages hence the livestock keepers will be educated as advised. ENG. KWAME MICHENJE All environmental protection measures shall be taken in accordance to the National environmental Policy.

No.	Name	Institution	Designation	Comments/Concerns	Response for Raised concerns
5	GLORY MALATA	Morogoro DC	Senior Livestock Officer (SLO)	1. The project is very helpful since it will help to reduce conflicts between livestock keepers and farmers. 2. Timely construction is advised.	ENG. BIBIANA ABEL The project is expected to commence as soon as possible after the approval of all necessary studies.
6	IRENE LYAMUYA	Morogoro DC	District Law Officer (LO)	1. Since there is no compensation, there should be a legal agreement with the land owners and local government leaders on offering the lands for the project.	CDO JANETH The District Law Officer will join with our team to witness the signing of agreement forms.
7	ENG MOHAMEDI M. MUHANDA	TARURA	District Manager	1. To access water, the livestock are not allowed to travel along the roads; they should only cross the road at the specified areas. 2. Livestock keepers should be educated on proper uses of roads to access water survives to avoid damages. 3. Road crossing ramps for livestock should be introduced. 4. In case of any damage of the area within road reserve during construction, then restoration is recommended such as backfilling and compaction, to avoid further damages.	ENG. KWAME MICHENJE Community members will be provided with enough education on the proper uses of the roads to access the services through public meetings, and the local government will be emphasized on ramp observation for cattle to cross the roads. ENG BIBIANA ABEL Restoration to the impacted areas will be implemented in the project as required.
8	BEATUS SAANANE	RUWASA	Ag. District Manager	1. The community should be made aware on the proper uses of water supply infrastructures so that they will not go to the rivers to pollute.	ENG PASCALIA BASIL All community members will be educated on the best practices to preserve the project infrastructures through public meetings.
9.	SGT. HASSANI NDURU	FIRE AND RESCUE FORCES	ESTATE	1. There will be no adverse impacts to the community since electricity will not be used; hence the risk of fire accidents is low.	ENG KWAME MICHENJE The proposed emergency measures shall be considered as advised.

No.	Name	Institution	Designation	Comments/Concerns	Response for Raised concerns
				2. There should be an installation of 9kg fire extinguisher in the pump house for emergency purposes.	
10	ENG. LAZACK A. KYAMBA	TANROADS	Regional Manager	1. In Some wards such as Mvuha ward, there are small bridges which cannot withstand large loads on them; hence consideration should be taken while transporting those loads.	ENG. BIBIANA ABEL Other safe routes will be used while transporting heavy loads to avoid roads with those small bridges.
11	BIBIANA ABEL	WRBWB	Environmental Engineer	1. The project is potential for protecting and preserving water resources such as rivers which would be impacted and polluted by livestock, hence environmental impacts mitigations should be applied properly throughout the project.	ENG. KWAME MICHENJE The anticipated environmental impacts in the project areas will be addressed properly and hence their mitigation measures as per National environmental Policy and Environmental management act (EMA)
12	HASSANI MWANGA	Dakawa village	Chairperson	1. Before any construction process to commence, all visitors arriving at the village e.g. Workers should report the village offices for introduction.	ENG PASCALIA BASIL All visitors arriving to the village will report to the village offices as required.

Source: Consultant, 2023

CHAPTER SIX

6.0 IMPACTS IDENTIFICATION AND ASSESSMENT OF ALTERNATIVES

6.1 Introduction

This chapter of the ESIA report describes and assesses the environmental and associated socioeconomic impacts, both positive and negative, likely to result from the proposed construction of the Water sector support program Phase II. Impacts were identified throughout the ESIA process by means of public consultation, detailed specialist investigations, the analysis of collected data and professional judgment.

6.2 Methodology of Identification of Impacts

Prediction of likely or unlikely occurring impacts in the proposed project based on the following used methodology.

6.2.1 Experts Knowledge

Expert or knowledge-based system was used to assist diagnosis, problem solving and decision-making.

6.2.2 Matrix Methods

For identification of subproject related impacts the Consultants team used the matrix method (screening matrix), which is based on identifying and qualifying actions of the sub project comparisons with natural and social environmental conditions. This generated anthropomorphic actions with impacts to the environment including health and safety to projects communities. The latter was carried out through the use of a cause effect relationship matrix.

6.3 Identification of Impacts

6.3.1 Susceptible Impacts' Generating Actions

Definition of actions in each stage of the project was done, which were considered as actions caused by a simple, concrete, well-defined and located cause of the impact.

Table 10: Concrete Actions on the Project Phases

Phase	Action
Planning	Evaluation of selected project area
	Preparation of all permit and certificated required by project
Mobilization and Construction	Land clearing, Setup & provisional facilities (building temporary offices, machinery and equipment place and fencing the project site)
	Transportation of consumables, equipment, materials and Staff
	Storage of materials, equipment and machinery
	Drilling of boreholes , pump house, cattle trough and tank construction
	Sourcing/preparation and transport of construction materials, including aggregate gravel, sand and stone borrowing, preparation of cement, timber, reinforcement bars, pipes and its fittings, casting of pre-cast materials such as concrete etc.
	Earth works including removal of top soils, excavation, cutting/filling, and compaction (hut hill removal)
	Trench preparation, installation and connectivity of water supply system
	Collection and disposal of waste generated during these phase
	Site commissioning
Operation & Maintenance	Use of extracted water by villagers and their cattle's
	Maintenance of the system
	Dismantling and demolition of structures and relatively utility

Site Abandonment/ Decommissioning	Sorting and proper handle of waste
	Cleaning and rehabilitation

Source: Consultant, 2023

6.3.2 Impacts' Generating Actions

In this section, key biological, physical, and social receptors were selected from the baseline data. The impacts of the sub project activities on each of these "Valued Ecosystem Components" were evaluated using a significance ranking process. The environment complexity and its systemic nature were broken down into several levels to obtain simple and concrete factors:

Table 11: Components and Factors of the Environment

Environment	Component		Factor
Abiotic	Climate		Temperature, Rainfall
	Atmosphere		Air Quality
			Dust
	Land		Structure
			Quality
			Relief
	Surface water		Surface drainage (run-off patterns)
			Quality
Biotic	Flora	Terrestrial	Habitat
			Distribution
			Species within any category
	Ecosystem		Biodiversity
Landscape	Landscape		Quality-vegetation cover, soil erosion
Socioeconomic	Economic		Change of land use
			Jobs
			Local and Regional Development
	Services Demand		Water
			Energy
			Communication
			Waste management and disposal

Source: Consultant, 2023

6.3.3 Impacts Prediction & Evaluation

After identification of impacts as a result of the proposed project's activities, their significance were determined, that is, whether they are acceptable or unacceptable and thus require mitigation. The significance of an impact was determined by considering the impact characteristics and the importance (or value) attached to them by the consultant team. Information provided by the consultant's team of experts was used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation.

$$\textbf{Overall Score} = (N \times M \times S) \times (E+D+P)$$

Where:

N = Nature; E = Extent, M = Magnitude, D = Duration, P = Probability, S = Significance

Table 12: Impacts Methodology Table

Nature				
Negative	Neutral	Positive		
-1	0	+1		
Extent				
Site	Local	Regional	National	International
1	2	3	4	5
Magnitude				
Low	Medium	High		
1	2	3		
Duration				
Short Term (0-5yrs)	Medium Term (5-11yrs)	Long Term	Permanent	
1	2	3	4	
Probability				
Rare/Remote	Unlikely	Moderate	Likely	Almost Certain
1	2	3	4	5
Significance				
No Impact/None	No Impact Aft Mitigation/Low	Residual Impact Aft Mitigation/Medium	Impact Cannot b Mitigated/High	
0	1	2	3	

Source: Consultant, 2023

The analysis was conducted on a quantitative basis with regard to the nature, extent, magnitude, duration, probability and significance of the impacts. The following definitions and scoring system applied:

Table 13: Description of impact

Nature (/Status) The project could have a positive, negative or neutral impact on the environment.
Extent • Site – impact within the project site. • Local – extend to the site and its immediate surroundings. • Regional – impact on the region but within the districts. • National – impact on an interregional scale. • International – impact outside of Tanzania.
Magnitude Degree to which impact may cause irreplaceable loss of resources. • Low – natural and social functions and processes are not affected or minimally affected. • Medium – affected environment is notably altered; natural and social functions and processes continu although in a modified way. • High – natural or social functions or processes could be substantially affected or altered to the extent th they could temporarily or permanently cease.
Duration • Short term – 0-5 years. • Medium term – 5-11 years. • Long term – impact ceases after the operational life cycle of the activity either because of natur processes or by human intervention. • Permanent – mitigation either by natural process or by human intervention will not occur in such a w or in such a time span that the impact can be considered transient

Probability • Almost certain – the event is expected to occur in most circumstances. • Likely – the event will probably occur in most circumstances. • Moderate – the event should occur at some time. • Unlikely – the event could occur at some time. • Rare/Remote – the event may occur only in exceptional circumstances.
Significance Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. Th range for significance ratings is as follows 0 – Impact will not affect the environment. No mitigation necessary. 1 – No impact after mitigation. 2 – Residual impact after mitigation. 3 – Impact cannot be mitigated.

Source: Consultant, 2023

On the other hand, if the nature of an impact is 0 (neutral or no change) or the significance is 0 (no impact), then the impact is 0. Impact Scores will therefore be ranked in the following way:

Table 14: Ranking of Overall Impact Score

+3	High positive impact
+2	Moderate positive impact
+1	Minor positive impact
0	No impact
-1	Minor negative impact
-2	Moderate negative impact
-3	High negative impact

Source: Consultant, 2023

S/N	Parameter/Activities			Construction Phase							Operation Phase					Decommissioning Phase		
		Cumulative Impact	Residual Impact	Putting up a site	Site clearance	Soil Investigation	Materials Transportation	Boreholes drilling	Cattle trough construction	DP Construction	Operating water supply facilities	LiquidwasteHandling	SolidWastehandling	Energyprovision	Maintenance works	Replacement of old structures	Landscaping	Termination of temporary Employment
1.	Reduced conflicts between farmers and pastoralists		√	+1	+1	+1	+1	+2	+3	+1	+3	+1	+1	+1	+2	0	0	0
2.	Employment opportunities		√	+1	+1	+1	+1	+3	+3	+3	+2	+1	+1	+1	+2	+1	+1	-1
3.	Waste management problems		√	-1	-1	-1	-1	-1	-1	-1	0	-3	-1	0	-1	-1	0	0
4.	Water resources protection		√	+1	+1	+1	+1	+2	+3	+2	+3	+2	+2	+1	+1	+1	0	0
5.	Soil erosion and sediments transfer	√		-1	-3	0	-1	-1	-2	-1	0	0	0	0	-1	-1	-1	0
6.	Noise, vibration and air pollution	√		-1	-2	-1	-2	-3	-2	-2	-1	0	0	0	-1	-2	-1	0
7.	Safety and Health of workers and nearby villagers		√	0	-1	0	-1	-1	-2	0	-1	-1	-1	-1	-1	-1	0	0
8.	Land acquisition		√	0	0	0	0	√	-2	0	0	0	0	0	0	0	0	0
9.	HIV/ AIDS cases	√		0	0	0	0	-3	0	0	-1	0	0	0	0	0	0	0
10.	Population Influx especially Pastoralists		√	-1	-1	0	0	-2	-3	0	-1	0	0	0	0	0	0	0
11.	Increased accessibility to safe and clean water		√	0		0	0	0	0	0	+3	0	0	0	0	0	0	0

12.	Improved social services		√	0		0	0	0	0	0	+3	0	0	0	0	0	0	0
13.	Increased wastewater production	√		0		0	0	0	-2	0	-3	0	0	0	0	0	0	0
14.	Saving people time especially pastoralists and women who are the main fetcher of water.	√		0	0	0	0	0	0	0	+3	0	0	0	0	0	0	0
15.	Loss of definite materials and land degradation		√	-1	-1	-1	-1	-1	-1	0	0	-1	-1	0	0	0	0	0
16.	Increased economic opportunities, especially for businesses that demand water	√		0	0	0	0	0	0	0	+3	0	0	0	0	0	0	0
17.	Improved personal hygiene and sanitation condition	√		0	0	0	0	0	0	+3	0	0	0	0	0	0	0	

Source: Consultant, 2023

6.4 Impact Description

6.4.1 Impact during Planning Phase

6.4.1.1 Failure of Approach to Initiate Plan for Projects

During planning phase of proposed water supply system/scheme is the time for preparing the time table to undertaking various activities such as time frame for site visit, time to identifies stakeholder and planning the way of engaged on design and how can be approach to get their view, design team working. Failure on approach on planning phase result to negative impact of long time as the output of sub-projects will not be environmental friend, social and economic benefit to community and national at large.

6.4.1.2 Evaluation and Compensation Effect

The proposed projects will not affected by any kind of compensation issues since the area is located in designated area with no near facility which may require compensation and current the area where the proposed project intended to be built owned by respectively village. The impact is positive of long term and highly significance.

6.4.1.3 Risk on Design Consideration

During planning phase it's important to consider all design criterions/ requirement of development of proposed drilling of boreholes and water supply system/scheme such as the discharge rate of borehole, pumping capacity, types of power to running project, capacity of tank allowed according to retention time, risk of climate change and feeding population which can have both negative and positive impacts depends on the initial preparation and risk taken during plan phase.

6.4.2 Mobilization and Construction Phase

6.4.2.1 Positive Impacts

6.4.2.1.1 Employment Generation

Proposed drilling of boreholes and construction of water supply system/scheme projects will expecting to provide a temporary and permanent job to the people in the respectively village. During construction phase all casual labors will be sourced from respectively villages and the total number more than 20 people will get temporary work. Security guard and technical technician may be employed permanent in the proposed project. The impact is considered positive of short term and moderate significance.

6.4.2.1.2 Improving Living Standard of the People

Having the construction of proposed project in one way or another will improve living standard of people and community as people may sales food (Mama Lishe), building material such as cement, iron sheet, pipes etc. leased place for living to professional expert involved so people across Morogoro and respectively village will early/get income from the proposed project. The impact is considered positive of short term and moderate significance

6.4.2.1.3 Revenue Collection by Government

Government will benefit directly from the construction of the project by collecting taxes from building material used in the project and other fees paid by developer and contractor. The impact is considered positive of short term and moderate significance.

6.4.2.2 Negative Impacts

6.4.2.2.1 Loss of Vegetation in the Project Area

Proposed project will involve the cutting of few trees and bushes during site clearance. The affected area in each village is a total area of 4900 square meter which causes the loss of existing plants (trees and bushes) for development of the project. The impact is considered to be negative, short term and moderate significance.

6.4.2.2.2 Land Degradation (Soil Erosion)

Construction activities of the proposed drilling of boreholes and construction of water supply system including the excavation activities of trench for foundation, drilling and pipe laying, these activities result to reduce the compaction of soil and by any factor of either wind or water (weathering) the land/soil will be eroded easily. The impact is considered to be negative, long term and moderate significance.

6.4.2.2.3 Increase of Solid Waste Generated

Construction activities of proposed project will increased the solid waste in the respectively village. Kind of waste expecting to be generated include both hazardous and non-hazardous waste such as debris from site clearance, bottle of water, food waste from works, scrap metal, piece of iron sheet, pipes and its fittings, plastic bags piece of block, from construction material. These waste expecting to be generated and increased in the project area which pollutes the environment and may result to injure from minor to major, growing place for insect such as flies etc. The impact is consider negative, long term with high significance.

6.4.2.2.4 Liquid Waste Generation

Pollution to environmental will result from improper handling of liquid waste generated from construction site. Construction site will generate mostly backwater from sanitary facility. Other liquid waste include spillage of oil which expecting to be low. When these liquid waste will not managed properly will spread to the environmental and cause eruption of disease and contamination to environment. The impact is consider negative, long term with high significance.

6.4.2.2.5 Spread of Incident of HIV/AIDS and STIs

Proposed project involve the skill and unskilled labour from different place of Tanzania, people will interaction to each other. Due to the wages paid to the worker may use it to seduce people wife. Transmission of these disease may occurred as people don't follow or don't need to take much time to know each other result to spread of HIV/AIDs and STIs to community. The impact is consider negative, long term with high significance.

6.4.2.2.6 Noise and Vibration Pollution

Equipment and machine employed on the construction site will result to higher noise level when not properly maintained. The impacts become negatively and affecting the hearing system to human body. Also the high vibration level will cause the impact of cracking of soil or human properties such as resident house. The impact is considered negative of long term with high significance.

6.4.2.2.7 Air Quality Pollution

Construction activities generate dust and gaseous to the air and cause air pollution. Air pollution direct affect the health of workers and neighbor community as cause the air borne disease (respiratory disease). The impact is considered negative of short term with high significance.

6.4.2.2.8 Increased Population Influx

During mobilization and construction phase, population in the area will be increased as people coming from different area for search job. These may contribute to scarcity of resource due to population increase in the area. The impact is negative of short term and low significance.

6.4.2.2.9 Safety and health Impact to the Workers

Workers safety on site will be endangered as a result of missing appropriates protective gears i.e. safety shoes, helmets, groves, ear plugs, grasses and by eventual accidents at work. Accidents might happen for different reasons in the work with equipment's, trucks and other related equipment. This might be caused by: work without protective equipment and/or safety belt, driving equipment with improper brake system, loss of attention and lack of concentration while working.

6.4.2.2.10 Risk of Accidents and Injuries

Because of the intensive engineering activities on site, workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations during tower for tank erection, wall erection or object, injuries from hand tools and equipment cuts from sharp edges of metal sheets and collapse of sections among others, carry of overload cargoes etc.

6.4.3 Operation phase

6.4.3.1 Positive Impacts

6.4.3.1.1 Water Resources Protection

Development of proposed drilling of boreholes and construction of water supply system/schemes will improved and protect the surface water resource especial the embankments of stream/river which lead to dry spring of that water source, this will be distracted by large group cattle's when enter to get water frequently. The impact is positive, long term and high significance.

6.4.3.1.2 Reducing conflicts between pastoralists and farmers in the project villages

The big challenge exist at Morogoro Region is the conflict between the pastoralist and farmers accelerated by the scarcity of water source. Many farmers growing their crops near the surface water source (stream and river) while the pastoralist depend on that surface water for their cattle to get water as when cattle move into surface water may enter to farms and eat crops which cause the conflict in between. The proposed project will solve the problem in the respectively village as having the component of cattle trough to be constructed so reduce the randomly movement of cattle to farmers farm. The impact is considered to be positive, long term and high significance.

6.4.3.1.3 Saving for accessing water time, for pastoralists and people especially for women, who are the primary water fetchers

Proposed drilling of boreholes and construction of water supply system/schemes will help to easily accessible of clean water by community and reduce the time of going to long distance to fetcher water. Also as the main work for women is to fetcher water so reduce the gender discrimination and other

gender miss treatment to women and child/early pregnancy associated with raping. The impact is considered to be positive, long term and high significance.

6.4.3.1.4 Improved Health and sanitation status Increased accessibility to safe and clean water

Health and sanitation of the community will be improved as the operation of proposed drilled of boreholes and construction of water supply system/schemes, by increase the accessibility of safe and clean water from the proposed project. The eruption of communicable disease (typhoid, cholera) caused by water will be omitted as the community will improve its hygiene behaviors as drinking, cooking and bathing by using clean water. The impact is considered to be positive of long term and highly significance.

6.4.3.2 Negative Impact during Operation Phase

6.4.3.2.1 Increased Population Influx especially pastoralists

Pastoralists from adjacent communities will travel to the project areas to use the water from cattle trough. As a consequence of increased social services and the availability of clean and safe water, the planned project will eventually open the door for more investments. More people will flock to the project regions or streets where this project will be executed as ideal places to live and invest.

6.4.3.2.2 Environmental Pollution due to Improper Management of Waste

Operation of proposed project will cause the environmental pollution if the liquid, emissions or solid waste generated will not be handled properly. The waste expecting to be generated includes emission from generator, sanitary waste (black water) and remains of foods, piece of papers and boxes. This impact is considered negative with short term and low significant.

6.4.3.2.3 Pollution of water source (borehole)

Due to use of water supplied, about 80% of it will become a wastewater (effluents), the discharge of improperly and inadequately treated effluents may cause surface and groundwater contamination. There is also the possibility for pollution of the groundwater and surface water due to leakages from and intrusion of storm water to the facilities (sewers, manholes, soak pits of septic tanks of public toilets).

6.4.3.2.4 Land conflict

It is anticipated that the proposed projects will be located on lands used for pastoralism which can lead to reduced grazing areas and add to conflicts if the grazing area is inadequate. However, the areas where the proposed project will be located are inhabited by the livestock keepers. With this regard, this impact is considered to be negative and very insignificant.

6.4.4 Decommission Phase

6.4.4.1 Negative Impacts

6.4.4.1.1 Noise Pollution and Vibration Associated with Demolition Activities

The demolition process will entail removal of roofing materials using crowbars and hammers, breaking of walling and reinforced slabs using sledge hammers and/or jack hammers, which utilize compressed air and lowering of materials from high to low levels. The exercise will therefore entail working at high level and all the necessary health and safety measures will be implemented including provision of personal protective equipment such as, safety harnesses, helmets, gloves, respirators, safety shoes,

coveralls, goggles and ear protectors. This is considered to be negative, short-term and of high significance.

6.4.4.1.2 Solid Waste Generation during Decommission Phase

Demolished process of proposed project will produce waste from building materials like bricks, stones, metal, and wood materials if stockpiled over the ground surface will ultimately cause solid wastes. If such materials let remain on the site for long period of time may have other side impacts to the environment and human health. Solid wastes to be generated during structures removal include but not limited to; scraps of wood and metals materials. This is considered to be negative, short-term and of high significance.

6.4.4.1.3 Workers Accidents and Hazards during Demolition

Accident may occur during demolition activities this can be caused by vehicle accidents, falling of object like water storage tanks, falling of the tank tower, and also accident due to absence of person protective equipment. This is considered to be negative, short-term and of high significance.

6.4.4.1.4 Loss of Employment

If for whatever reason the project is closed down, the people employed by the project will lose their jobs. This will have significant impact to these people and their families. The impact is considered negative, long-term with high significance:

6.5 Project Alternatives

Consideration of project alternatives is critical to ensuring that the developer and decision makers have a larger base from which to select the best solution. The following possibilities have been studied and are discussed as follows.

6.5.1 Alternative Site

Three 3 different options for proposed project site were surveyed. The proposed sites were selected due to the fact that they were found to have potential for reliable amount of water compared to others and its location is favorable for project construction.

6.5.2 Energy Alternative

The use of other alternative energy sources apart from power from the solar energy was considered such as use of diesel-powered generator.

6.5.3 Solid Waste Management Alternatives

The proposed project will generate some quantities of solid waste during all phase of construction. An integrated solid waste management system is recommendable.

a. **Alternative one**: **Source reduction**: The proponent will give priority to Reduction of solid waste at source of the materials. This option will demand solid waste management awareness programme.

b. **Alternative two: Recycling:** Recycling, of the solid waste is the alternative way of solid waste management by applying the role of separating solid waste at point source of generation in order to recycle or re use the waste.

c. **Alternative three: Transportation of waste:** Transfer of the collected amount of waste from the special designated area into a nearby dump site at Morogoro district. The containers have to be placed at well accessible, strategically chosen sites.

6.5.4 Accessibility to site Alternatives

a. **Alternative one:** The accessibility of the site project areas is through the Old Dar es Salaam Road from Morogoro Town, then Kiroka - Kibangile Road, then Lumbu - Matombo Road and finally Matombo - Dalla.
b. **Alternative two:** The site can be accessible through Morogoro – Mikese Road, then Mikese – Magogoni Road, and finally Dalla – Kongwa Road for Kongwa and Dalla site, and Lukurunge Road for Lukurunge Village Site.

CHAPTER SEVEN

7.0 PROJECT MITIGATION AND ENHANCEMENT MEASURES

7.1 Introduction

The previous chapter has identified the potential impacts and their significance. Based on the analysis and hence classification of the potential impacts that may result from the proposed project activities in the area. This chapter describes the mitigation measures for those impacts considered to be of moderate to high significance. The standards upon which the mitigation measures are targeted, the responsible entity and the associated mitigation costs are presented as part of the Environmental management plan. In militating against the impacts, the proposed measures also take into consideration the impacts that are not a result of the project operations but of historical nature.

7.2 Mitigation and Enhance Measure for the Proposed Project

7.2.1 Mitigation Measure during Planning Phase

7.2.1.1 Failure of approach to initiate plan for projects

To mitigate that,

- Consultancy shall work and incorporated all concerns raised by stakeholder to produce better result;
- Developer shall work together with consultancy to insure all approach intended are meeting.

7.2.1.2 Risk on design consideration

- Design team should consider all design criterions/ requirement for development of proposed drilling of boreholes and water supply system/scheme such as the discharge rate of borehole, pumping capacity, types of power to running project, capacity of tank allowed according to retention time, risk of climate change and feeding population which can have both negative and positive impacts depends on the initial preparation and risk taken during plan phase.

7.2.2 Mobilization and Construction Phase

7.2.2.1 Enhancement Measure for Positive Impacts

7.2.2.1.1 Employment Generation

To mitigate that

- Developer in collaboration with contractor should provide the priority of employment to the villagers in the respectively project area
- Provision of equal opportunities in the employment to man and woman

7.2.2.1.2 Improving Living Standard of the People

To mitigate that,

- Proposed project shall be implemented in respectively time frame
- Building material shall be sourced from local dealer in the country
- Tender to construct the proposed project should be given to local contractor.

7.2.2.2 Mitigation Measure for Negative Impacts

7.2.2.2.1 Loss of Vegetation in the Project Area

To mitigate that\

- Clearance of vegetation shall be minimized by

- After construction re-vegetation/restoration to affected part should be done.

7.2.2.2.2 Land Degradation (Soil Erosion)

To mitigate that

- Unnecessary ground clearance shall be avoided
- Controlled tree clearance and site shall be fenced.

7.2.2.2.3 Increase of Solid Waste Generated

To mitigate that

- Proper management of solid waste on site shall be done by contractor
- Provision of waste collection bin with well label on construction site
- Only inert materials or readily decomposable materials shall be disposed by burial.
- No burning of waste materials which produces black smoke shall be approved. Plastics shall not be burned
- All waste that is to be removed from site of production will be taken to the Approved dumpsite.

7.2.2.2.4 Liquid Waste Generation

To mitigate that

- Developer shall require to ensure the contractor has Construct of temporary sanitary facility
- Servicing of machines such as drilling machine and generator shall be done properly and oil waste shall collect and stored properly when waiting to authorize dealer to collect.

7.2.2.2.5 Spread of Incident of HIV/AIDS and STIs

To mitigate that impact

- Safety, Health and Environment (SHE) induction course
- Support HIV/AIDS campaigns Provision of condoms
- The awareness raising and prevention measures particularly for communicable diseases such as hepatitis B, C and HIV/AIDS shall be done.
- Contractor shall develop Code of Conduct for workers to prevent unwanted behaviour.
- Developer shall provide Voluntary Counselling and Testing (VCT) Centres for HIV/AIDS.

7.2.2.2.6 Noise and Vibration Pollution

To mitigate that

- Contractor shall ensure frequently maintenance of machine and equipment used
- Provision of Workers in the vicinity of or involved in high-level noise shall be provided with respective protective gear i.e. earplugs& earmuffs
- No explosive materials should be used at site and if used there shall be prior information/ warning to the nearby community on the usage of explosives with possible tremor and excessive noise that will alert the community and hence reduce possible shocks.
- Minimization of the movement of vehicles on unsealed surfaces and strict speed controls shall be implemented for all transport vehicles.

7.2.2.2.7 Air Quality Pollution

To mitigate that

- In case of high dust level the contractor shall spray water to reduce dust level
- Maintenance and services of drilling machine, vehicles and generator shall be frequently
- Provision of personal protects equipment to workers working in area prone to air pollution.

7.2.2.2.8 Safety and health Impact to the Workers

To mitigate that

- The proposed site shall contain the safety sign to guide the workers
- Provision of the protective gears and strictly enforce to used it
- The proposed site shall have the first aid kit and training safety offers
- Record book shall be onsite and every minor to major accidents shall be recorded and reported as in occur.

7.2.3 Operation phase

7.2.3.1 Enhancement Measure for Positive Impacts

7.2.3.1.1 Water Resources Protection

To mitigate that

- Developer shall require to set the low price for water use in order to attract villager to use it instead of going to surface water source
- Formulate the community group which will legal control and operate the proposed project
- Enforced law to all who's sent their cattle to water source instead of use that constructed.

7.2.3.1.2 Reducing conflicts between pastoralists and farmers in the project villages

To mitigate that developer shall ensure availability of water is at high percentage to avoid pastoralists to return to surface water.

7.2.3.2 Mitigation Measures for Positive Impacts

7.2.3.2.1 Increased Population Influx especially pastoralists

To mitigate this impact;

- The local government authority of Morogoro District will devise a plan to control population increase.

7.2.3.2.2 Environmental Pollution due to Improper Management of Waste

To mitigate that all kind of waste generated during operation phase should be properly handle by

- Project site shall contain waste bin in all targeted point
- Services of generator should consider handling of oil waste
- Emptying of septic tank shall be conducted frequently
- General project cleanness.

7.2.3.2.3 Pollution of water source (borehole)

To mitigate this impact;

- Catchment management plans will be developed with the aim of conserving and allowing recharge of water resources;

- Community sensitization regarding the water supply system and water conservation measures will be encouraged: saving water is an efficient way of reducing the overuse of ground water resources. It is not only decreasing the amount of the water withdrawn, but may also reduce the threat of pollution;
- RUWASA should adhere to the safest maximum abstractable water quantities throughout the project life. The water intake will be designed to allow minimum Environmental Flow (EF) pass through the abstraction point. Flow monitoring devices will be installed to monitor minimum EF by proponent and RUWASA; and
- Proponent should adhere to the stipulated limits in the water abstraction permit obtained from Wami/Ruvu Basin Water Board

7.2.3.2.4 Land conflict

To mitigate this impact;

- Developer will fence the proposed project areas to prevent unauthorized access to the site;
- Developer will liaison with local leader to provide security in the proposed project areas; and
- Education will be provided to people on the importance of protecting the project.

7.2.4 Decommission Phase

7.2.4.1 Negative Impacts

7.2.4.1.1 Noise Pollution and Vibration Associated with Demolition Activities

To mitigate that

- Equipment used during decommission should be proper maintained
- Workers involve in the demolition activities should provide with protective person equipment (ear plugs, gloves, boots etc.).
- Spray water to demolished area to reduce dust level.

7.2.4.1.2 Solid Waste Generation during Decommission Phase

To mitigate that

- Developer should employ a registered company to collect and disposal waste
- Sorting of demolition waste should be done at source.

7.2.4.1.3 Workers Accidents and Hazards during Demolition

To mitigate that

- Provision of PPEs to the workers during demolition phase
- First Aider personnel and first aid kit should be present on site.

7.2.4.1.4 Loss of Employment

To mitigate that

- Prepare the workers for forced retirement by providing skills on self-employment, and wise investment of the retirement benefits.

CHAPTER EIGHT

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

8.1 Overview

Among the key tasks of scoping exercise is to predict potential impacts of the project and its corresponding mitigation measures which will be further analyzed in the impact assessment study. Based on the impacts mentioned by stakeholders and consultant observation at the site coupled with experience from other similar assignments, the proposed mitigation measures provide the basis for the development of environmental management plan and monitoring plan for the Project, required to meet World Bank's and NEMC's environmental approval and permitting requirements, a number of impacts related to this project were drawn out and presented preliminary EMP in **Table 15**.

Table 15: Environmental and Social Management Plan for the proposed project activities

Impact	Management Measure	Target level/ Standard	Responsible party	Costs (TZS)
Mobilization and Construction Phase				
Loss of Vegetation due to clearance to accommodate the proposed project components	• Vegetation clearance will be done to those areas which are proposed for new establishment • Strict control of survey vehicles and trucks to ensure that they operate only within the area to be disturbed by access routes and other works.	No. significant loss of biodiversity	Proponent	5,000,000
Land degradation (soil erosion)	• The contractor will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms/sites, whose projects have undergone satisfactory environmental assessment and received appropriate approval. • Limit the excavation area to reduce the soil to be loosed as may blowing by wind or water	Physiochemical and bacteriological parameters (i.e., pH, EC, pathogens, heavy metals)	Proponent	
Noise, vibration and air pollution	• Frequently maintenance of machine and equipment used • Vehicles shall be shut down during idling. • Provision of Workers in the vicinity of or involved in high-level noise should be provided with respective protective gear i.e. earplugs & earmuffs • No explosive materials should be used at site and if used there shall be prior information/ warning to the nearby community on the usage of explosives with possible tremor and excessive noise that will alert the community and hence reduce possible shocks. • Minimization of the movement of vehicles on unsealed surfaces and strict speed controls shall be implemented for all transport vehicles • The contractor to ensure that all vehicle loads of soil /aggregates are well covered to prevent fugitive dust along the route	Not exceeding 85 dBA for 8 hours during the day and not exceeding 45dBA during the night. Temperature, H_2S, SO_X, NO_X and Dust	Proponent	1,500,000

Impact	Management Measure	Target level/ Standard	Responsible party	Costs (TZS)
Environmental pollution from poor management of construction waste	• Post appropriate signage such as "DO NOT LITTER" or "USITUPE TAKA" at all strategic sites • Restriction of burning any vegetation and combustible waste at the site. • Unusable construction waste, such as damaged pipes, formwork and other construction material, will be disposed of at an approved dumpsite. • Introduce on-site bins for daily activities at the each of the construction site. • Sort and dispose solid waste at designated sites. • Where topsoil is pre-stripped, it shall be stored for future site rehabilitation activities.	No pollution	Proponent	1,000,000
Population Influx	• Locally available people only, should be employed Increased security in the area • Water resource planning and infrastructure development should consider population migration trends of the area and future population increase of human and livestock.	No or minimum influx	Proponent	2,000,000
Injuries from Occupational health and safety hazards during construction	• Use of Protective gears • First aid kit with full equipped should at site • Safety offers should be at site all the time • Safety training to workers and • Put safety signs in strategic areas in construction phase.	• Availability and Functionability of Health and safety facilities • Functionability of sanitation facilities	Proponent	2,000,000

Impact	Management Measure	Target level/ Standard	Responsible party	Costs (TZS)
Spread of disease such as HIV/AIDs	• The contractors will prepare site specific Health, Safety and Environment (EHS) Plan and obtain approval from the Supervision Consultants. The Plan should also include awareness raising and prevention measures particularly for communicable diseases such as hepatitis B, C and HIV/AIDS • WRBWB and the Contractor should use qualified NGOs, or professionals to undertake these programs as per requirements of the Ministry of Health. • Develop Code of Conduct for workers to prevent unwanted behavior. • Developer shall provide Voluntary Counseling and Testing (VCT) Centres for HIV/AIDS	Zero patient	Proponent	1,000,000
Operation Phase				
Resource scrambling due to increased population influx	• Increased security in the area • Water resource planning and infrastructure development should consider population migration trends of the area and future population increase of human and livestock.	No influx	Proponent	1,000,000
Threat to public health	• Whenever possible WRBWB will support on – going and new community health and safety programmes undertaken by the District and Village leaders for community mobilization to control preventable communicable diseases and vectors through awareness and sensitization campaigns:	Zero accidents and injuries	Proponent	1,500,000

Impact	Management Measure	Target level/ Standard	Responsible party	Costs (TZS)
Pollution of water source(borehole)	• Catchment management plans will be developed with the aim of conserving and allowing recharge of water resources; • Community sensitization regarding the water supply system and water conservation measures will be encouraged: saving water is an efficient way of reducing the overuse of ground water resources. It is not only decreasing the amount of the water withdrawn, but may also reduce the threat of pollution; • RUWASA should adhere to the safest maximum abstractable water quantities throughout the project life. The water intake will be designed to allow minimum Environmental Flow (EF) pass through the abstraction point. Flow monitoring devices will be installed to monitor minimum EF by proponent and RUWASA; and • Proponent should adhere to the stipulated limits in the water abstraction permit obtained from Wami/Ruvu Basin Water Board.	Physiochemical and bacteriological parameters (i.e. pH, EC, pathogens, heavy metals) Turbidity / suspended solids, oil and grease		2,000,000
Land conflict	• Developer will fence the proposed project areas to prevent unauthorized access to the site; • Developer will liaison with local leader to provide security in the proposed project areas; and • Education will be provided to people on the importance of protecting the project.	No conflict is occurring	Proponent	1,000,000
Decommission Phase				
Loss of employment during decommissioning phase	• Prepare the workers for forced retirement by providing skills on self-employment, and wise investment of the retirement benefits.	Number of workers to be retrenched	Proponent	10,000,000
Contamination and impaired Environment from dust (air quality)	• Supress dust by spraying of water on dusty surfaces	Temperature, H_2S, SO_X, NO_X and Dust	Proponent	1,000,000
Contamination and impaired Environment from demolition waste	• Developer should employ a registered company to collect and disposal waste • Sorting of demolition waste should be done at source • Resorting of environment to its nature state	As minimal as possible	Proponent	3,000,000

Source: Consultant, 2023

CHAPTER NINE

9.0 ENVIRONMENTAL MONITORING PLAN

9.1 Overview

The purpose of this chapter is to outline the key monitoring requirements identified through the ESIA process to monitor the environmental and social performance of the project. It helps to anticipate possible environmental hazards and/ or detect unpredicted impacts over time. Also monitoring must include checking for effectiveness or otherwise of mitigation and enhancement measures.

Monitoring includes:

- Visual observations;
- Selection of environmental parameters at specific locations;
- Sampling and regular testing of these parameters.

9.2 Objectives of Environmental Monitoring

- The overall objectives of the monitoring activities are to:
- Ensure regulatory requirements are met;
- Check that impacts do not exceed national environmental standards
- Verify predictions made in the ESIA by obtaining real time measurements;
- Verify that mitigation measures are effective and implemented in the manner described in Chapter 7;
- Provide early warning of potential environmental impacts; and
- Inform future operations and contribute to continuous improvement in the management of environmental and social issues related to the project.

WRBWB should in turn undertake independent monitoring of selected parameters to verify the results of the Contractor and to audit direct implementation of environmental mitigation measures contained in the ESMP and construction contract clauses for the Project. Periodic on-going monitoring shall be required during the life of the Project and the level can be determined once the Project is operational.

Table 16: Environmental and Social Monitoring Plan for the proposed project

Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/Standard	Proponent	Annual Cost (Tsh)
Mobilization and Construction Phase							
Loss of Vegetation cleared to accommodate project structures	Number of trees	Before and after clearance	Project area	Number	Zero destruction of the environment	Proponent	1,500,000
Noise and air pollution	Noise level, Air quality	Quarterly	Project site	dB PM_{10}	Below 70 dB	Proponent	1,000,000
Pollution due to mismanagement of construction waste	Waste generated	Daily	Project site	Kg	No pollution	Proponent	1,000,000
Occupational health and safety of construction workers	Availability and proper application of protective gears	Daily	Construction site	NA	All workers use protective gears properly	Proponent	1,000,000
Operation Phase							
Threat to public health	Water borne diseases, accidents	Quarterly	Project site	number	NA	Proponent	1,000,000
Increased HIV and AID's Spread	Spread of HIV AIDS	Quarterly	Project site	number	NA	Proponent	1,000,000
Noise pollution form generator	Noise level, Air quality	Quarterly	Project site	dB PM 10	Below 70 dB	Proponent	1,000,000
Pollution of water sources (boreholes)	Relevant physical, chemical, biological parameters	Quarterly	Boreholes	Respective unit of measure	Meeting water demand and maintain Acceptable water quality standards	Proponent	3,000,000
Land conflicts	Number of conflicts	Quarterly per annum	Project area	Number of occurrence	No conflict is occurring	Proponent	1,000,000

Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/Standard	Proponent	Annual Cost (Tsh)
Decommissioning phase							
Employment opportunities	Percentage of local labour employed	Once during decommissioning		Number of local labors employed over total staff	Balance employment to local people	Proponent	10,000,000
Restoration of the environment	Number of trees planted	Frequently	Project site	Number of trees planted	Restoration of the site to its original status	Proponent	5,000,000
Noise and vibration level	Noise and Vibration levels	Frequently during decommissioning	Project site	Decibels for noise and watts per metres square for vibration	Below 70 dB Vibration level should be within permissible levels	Proponent	1,000,000

Source: Consultant, 2023

CHAPTER TEN

10.0 COST BENEFIT ANALYSIS

10.1 Introduction

This section addresses financial, economic and an extended cost-benefit analyses for the proposed project. Proponent shall incur in terms of investment and the cost of dealing with the proposed mitigation and monitoring measures proposed to alleviate negative impacts emanating from various activities of the project as well as benefits that will be generated by the project. The assessment has identified a number of benefits and cost that will be borne by local communities, Water board, District council, regional and national at large. These were identified by stakeholders and analyzed by the EIA team.

Cost benefit analysis is normally done in the framework of feasibility study. The aim of cost-benefit analysis is to inform decision makers on:

- Whether it makes economic benefit to continue with the proposed commercial/project development;
- Whether the chosen option is cost effective alternative;
- Whether the design of the proposed development can be implemented on time;
- Whether the proposed development can be implemented without having more negative effects to the surrounding community and its environment.

The costs may include capital expenditures, operating and maintenance costs, staff costs, materials, research and development, opportunity costs and environmental health and other social costs. Benefits may include better, more cost-effective service delivery, the avoided costs being the costs of the existing or conventional service delivery option, additional revenues generated productivity, savings, environmental health and other social benefits. Before the project is approved by the investor it has to pass the net present value test. The costs and benefits were used to calculate the net present value (NPV) of the proposed project. According to the feasibility study conducted by the proponent, the net present value of the project is positive and the project is considered socially and economically feasible. The proponent analyzed scenarios under different assumptions. The results of these calculations led to judgments on the economic position of the project under changing states of affairs. As these calculations are constantly adjusted to the present situation, this leads to a fair knowledge on the status quo of the investment.

10.2 Benefits Related to the Project

Several benefits are associated with the proposed construction of water supply and sanitation infrastructure both at local and national level in terms of revenue generation and the multiplier effects associated with linkages with local and national economy. Likewise, there are costs that must be incurred in order to gain the expected benefits.

10.2.1 Environmental Cost Benefit Analysis

Environmental cost benefit analysis is assessed in terms of the negative versus positive analysis. Furthermore, the analysis is considering whether the impacts can be ameliorated and the costs of mitigating the impacts are reasonable. As it has been demonstrated in the previous chapter, the benefits of the project, in terms of financial and social benefit are substantial, the environmental impacts can be mitigated and the financial resources needed to mitigate the impacts are relatively

reasonable compared to the actual capital investment. The EIA study revealed that the identified environmental impacts can be mitigated at the required standard if the proposed mitigation measures will be put on ground.

10.2.2 Social Economic Cost Benefit Analysis

The project will directly employ number of people (more than 30 workers) temporary employment during construction phase. Also the project will indirectly support many other business activities within the project area as Improved Water quality and quantity, Improved Health and Sanitation and Savings in time to go fetch water, people can do income generating activities. All these will contribute towards poverty eradicate on activities. It is a fact that the development of the project will limit access to the area. As it can be seen in the impact analysis, there are no serious negative social economic impacts. It can therefore be deduced that the social benefit outweighs the social costs that are anticipated. The availability of proposed project will contribute to the economy of Morogoro Region and the country at large.

10.2.3 Possible Costs to Government

The proposed project will be funded by Government of Tanzania in collaboration to World Bank to ensure the safe and clean water is accessible to all people and prevent the destruction of water source.

10.3 Total Annual Cost Computation

10.3.1 Costs Related to the Project

The estimated cost for the implementation of the proposed construction and operation of proposed project is estimated to be ninety-two million two hundred seventy two thousand one hundred Tanzania shillings only (TZS. 92,272,100.00). The proposed project will be funded by Proponent to cover all the investment cost; however this cost might change due to some externalities that might arise in between and disturb the normal estimation.

10.3.2 Project cost and benefit evaluation

The Project cost and benefit evaluation will be computed using discounted method. According to 2022 Tanzania discount rate is 5% - 7% and discount rate of 5% will be chosen to compute the Project cost and benefit evaluation.

- PV=FV/ (1+R) n Where PV= Present Value, FV= Future Value, R= Rate of discount money, n= Period, Discount rate= 5%. Also
- NPV = (DF-DC) +CP Where NPV=Net Profit Value, DF=Discounted Benefit, DC=Discounted Cost and CP= Cost of project.

With this regard, drilling of boreholes in the above-mentioned villages, aims at providing an alternative water supply for livestock in order to minimize their direct access to the rivers so as to conserve the catchments as per the main objective of Sub-component 1.3 of WSSP II; the activity will reduce bank erosion, siltation and pollution in the Ruvu River. Therefore, the project proponent shall work to obtain the net profit value of the project once the operation starts. This is because the actual benefit of the project cannot be established at this point and the project is not intended to obtain any financial profit but to serve the livestock keepers and their livestock and to protect water sources especially rivers available in the Mvuha catchment.

CHAPTER ELEVEN

11.0 DECOMMISSIONING PLAN

11.1 Introduction

The closure plan is highly influenced by the priorities of the surrounding communities and those of the Nation. As far as this project is concerned, Proponent will ensure that common liaison is enhanced between with all relevant stakeholders at all stages. The decommissioning plan will remain a "living document," and revisions will be made throughout the operating life of the project. It must be reviewed periodically and revised to reflect any changes in project Installation or operation that might affect decommissioning. However provisionally the Proponent has put forward initial closure plan with the following objectives

i. Prevent or minimize adverse long term social and environmental impacts of the project after closure.
ii. Create a self-sustaining ecosystem or alternate land use based on an agreed set of priorities among key stakeholders;
iii. Enable all stakeholders to have their interests considered during closure time;
iv. Ensure the process of closure occurs in an orderly, cost-effective and timely manner;
v. Ensure that the cost of closure is adequately represented in proponent budgets;
vi. Ensure clear accountability and sufficient resources, for the implementation of the closure plan;
vii. Establish appropriate indicators for evaluating implementation of closure process.

The decommissioning plan has five phases: (1) pre-removal monitoring; (2) permitting; (3) interim protective measures; (4) Project removal and associated protective actions; and (5) post removal activities, including monitoring of environment and socio economic activities. The description that follows outlines the activities that will occur in each phase:

a. **Pre-removal monitoring:** Pre-removal monitoring includes environmental and socio economic status of the project site and the surrounding. This monitoring is essential to identify if there is any environmental or social liability which need to be settled before the permit for closure is given. This period will also be used to inventories all assets and facilities that need to be disposed of and to prepare a final decommissioning plan for approval by NEMC.
b. **Permitting**: Developer shall obtain all permits required to undertake removal of the Project. This basically will include NEMC, etc.
c. **Interim Protective Actions**: This will take care of any interim protective measure that needs to be implemented to protect human health and environment, if any.
d. **Project Removal**: As noted above, the removal of the project will be completed within twelve months.
e. **Post-Removal Activities**: Post-Project removal monitoring will continue for one year.

Project removal will begin six months after closure and continue for twelve months. Within the six months from closure, Proponent will inventory all components that need to be removed and or disposed it.

11.2 Decommissioning Plan

The decommissioning plan for the closure of the proposed drilling of boreholes and water supply schemes/system at Morogoro District in the respectively villages will expecting after 20 years of the

project life, Decommissioning of the Water Supply Scheme may be required. Decommission may involve demolition of structures and site restoration. It is therefore for the installed pipelines, equipment's and the technology used to become obsolete in less than the life span of the project. This will need replacement and upgrading of the systems and associated accessories. If the upgrading is not possible the infrastructure will be removed and site rehabilitated to their original conditions. However, the extension of pipeline is still seen as a feasible that will be used for many years to come, because of its robustness and reliable water source. During the actual decommissioning phase the developer will have to work out the actual costs and include that on the overall cost of the project.

Table 17: Decommissioning plan for the proposed projects

Planed Activities	Responsible institution	Duration	Estimated cost (TZS)
Provide information to workers on site termination; create awareness to workers who are losing employment on alternative means of generating their income and giving notes of termination of contracts.	• Proponent	Three months	500,000
Closure of the site	• Proponent	One day	No cost
Payment of compensation and terminal benefits to workers	• Proponent	One month	20,000,000
Dismantling of pump machines, pipes, water tank among others.	• Proponent	Two weeks	3,000,000
Demolition of site fence guard hut, toilet facilities and other structures	• Proponent	Two weeks	2,000,000
Collection and sorting of wastes for reuse, recycle and disposal	• Proponent	One week	2,000,000
Removal of wastes such as rubbles, and other wastes to the disposal site	• Proponent	One week	2,000,000
Refilling of depression and land leveling	• Proponent	One week	3,000,000
Compaction of the refilled land	• Proponent	Two weeks	2,000,000
Planting natural trees and grasses of origin to the cleared land	• Proponent	Two weeks	500,000
Maintaining and monitoring of planted trees and grasses	• Proponent	Two years	2,000,000

Source: Consultant, 2024

CHAPTER TWELVE

12.0 SUMMARY AND CONCLUSION

12.1 Summary

The Wami/Ruvu Basin Water Board (WRBWB) through the Government of the United Republic of Tanzania, and proceeds of credit from the International Development Agency (IDA) of the World Bank Group, intends to implement the Water Sector Support Project Phase II (WSSP II). The project shall involve drilling of boreholes, cattle troughs, storage tanks and DP constructions, which will provide sustainable water supply for livestock at Dalla Village, Mvuha Ward in Morogoro District. The aim is to minimize direct access of livestock to the rivers so as to conserve the catchment.

This study identified socio-economic and environmental issues associated with the proposed project and provides relevant mitigation measures to prevent or minimize adverse impacts. Based on the environmental and social impact assessment carried out for the proposed project, the general assessment indicates no significant negative impacts on environmental and social provided that the recommended mitigation measures will be adequately and timely implemented. The identified impacts will be managed through the final to be proposed mitigation measures and implementation regime laid down in this study. However, there are several positive impacts, which include creation of employment, reduced conflicts between pastoralists and farmers, business growth and economic gains to local community as well as income to both local and central governments.

12.2 Conclusion

The Environmental Management Act (Cap 191) of 2004 (EMA, 2004) and the Environmental Management (Environmental Impact Assessment and Audit) regulations G.N. No. 349 of 2005 as amended in 2018 requires this proposed project to be registered by the National Environment Management Council (NEMC) for screening. It is recommended that deep exploratory production borehole drilling should be considered during the drilling period because the district is dominated by crystalline basement rocks which normally prohibits aquifer recharge, percolation, development and exploration of groundwater water. This formation has also tendency to have low yields and slight saline water which inherit from the host rocks.

In most cases the outcomes from the EIA study have shown that the project has significant economic and social benefits to the local communities in the area. Economically, the local communities in the project area are likely to benefit directly from the project due to availability of water for human consumption and livestock, employment opportunities and improved income generation by selling foodstuff and other local goods for the period of construction phase and operation phase. The employment of the local people into the project during construction and operation could also be considered as one of the mitigation measures against increased incidence of HIV/AIDs and STIs prevalence since there will be new comers to interact with the local community members. Generally, the project shall improve the wellbeing of the people, availability of water to livestock and protection of rivers within the Mvuha catchment. In a long lasting the project shall contribute the national effort towards poverty alleviation, hence attaining the outlined goals in the Sustainable Development Goals (SDGs) and the National Strategy for Growth and Reduction of Poverty (NSGRP, 2025). Moreover, most of the negative impacts identified in this ESIA study are of low significance and could be straightforwardly, mitigated through design and good engineering practice.

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APPENDICES

Appendix A: Certificate of Registration for Taxpayer Identification Number

1351810

TRA

TANZANIA REVENUE AUTHORITY

CERTIFICATE OF REGISTRATION

FOR

TAXPAYER IDENTIFICATION NUMBER (TIN)

ISSUED UNDER SECTION 21 OF THE TAX ADMINISTRATION ACT 2015

THIS IS TO CERTIFY THAT

WAMIRUVU BASIN WATER BOARD

HAS BEEN REGISTERED WITH THE TANZANIA REVENUE AUTHORITY AND ASSIGNED THE TAXPAYER IDENTIFICATION NUMBER

143-787-133

WITH EFFECT FROM: 23 September 2020

TRA LOCATION: MOROGORO TAX OFFICE: MOROGORO

PHYSICAL LOCATION:

STREET / AREA: MAZIMBU ROAD

ABDUL Y. MAPEMDE

AG. COMMISSIONER FOR DOMESTIC REVENUE

OFFICIAL SEAL

NOTE THE REQUIREMENTS UNDER WHICH THIS CERTIFICATE IS ISSUED ARE STATED OVERLEAF

Appendix B: Names and signature of the consulted Stakeholders

MOROGORO DC

STAKEHOLDERS CONSULTATION FORM

CONSULTANCY SERVICES FOR CONDUCTING ENVIRONMENTAL IMPACT ASSESSMENT(EIA) FOR THE BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO CATCHMENTS IN MOROGORO.

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO SIMU	SIGNATURE SAHIHI
21/9/2023	SGT HASSAN NDUKU	ESTATE	FIRE & RESCUE FORCE	0712049249	[signature]
21/9/2023	Eng. Mohamed. A. Mwanda	DM	TARURA	076723526	[signature]
21/9/23	Eng. Lareck A. Kyamba	RM	TANROADS	0765057498	[signature]
21/09/2023	Janeth Chatta	AD	DAS - MORO	0753-044403	Chatta
21/09/2023	Eng BIBIANA ABEL	ENV. ENGINEER	WABWB-MORO	0769753965	[signature]
22/09/2023	EDWIN MATHAKA	AG DED	MORO DC	0768951585	[signature]
22/09/2023	ROSE SEMIONO	DEMO	MORO DC	0783655010	[signature]
22/09/2023	FORGET SOLOMONI	WAEO	KATA BWAKILA CHINI	0787858865	[signature]
22/07/2023	IRENE LYAMUYA	LO	MORO DC	0687674149	[signature]
22/09/2023	Glory Malata	SLO	MORO DC	0785334229	Malata
22/09/2023	BEATUS C. SAANANE	A.DM	RUWASA	0783608286	[signature]

STAKEHOLDERS CONSULTATION FORM

CONSULTANCY SERVICES FOR CONDUCTING ENVIRONMENTAL IMPACT ASSESSMENT(EIA) FOR THE BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO CATCHMENTS IN MOROGORO.

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO. SIMU	SIGNATURE SAHIHI
23/9/2022	AKLEY R. MKOTA	VEO	DALA	077-429636	[signature]
-11-	KADIRI. O. VAVATU	MW/KITI	DALA	0788836666	[signature]
-11-	JAMES NTAMBI	M/KITI KITONGOJI	KILENGEZI	0692337554	JNtambi
25/09/2023	HAMISI Ndokoi	MJUMBE	DALA		HNdoko.
25/09/2023	RAMADHANI A. ISMAIL	MJUMBE	DALLA	0687439103	[signature]
-11-	ABUBAKAR. K. KIWAMBEE	MJUMBE	DALLA	0683365712	[signature]
-11-	MYOKA T. BUJIKU	MJUMBE	DALA	0688619337	M. Toha
-11-	EMANUEL IKOLI	—	DALA	0785875673	[signature]
-11-	PHILEMON MSHOLA	MJUMBE	DALA	0655969373	[signature]
-11-	SEIF SAID MBAZIJI	WEO	MVUHA	0788600164	[signature]
-11-	NGELELA LUPUGA	MJUMBE	DALA	0783-657648	N.L
-11-	NJEPA MANDILA	MJUMBE	DALA	0699-566091	N.M

[signature]

AFISA MTENDAJI
KIJIJI CHA DALLA

STAKEHOLDER CONSULTATION FORM FOR THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE DRILLING OF15 BOREHOLES WITHINMVUHA AND MGETA MICRO CATCHEMENTSIN 15 VILLAGES OF MOROGORO AND MVOMERO DISTRICT, MOROGORO REGION

LIST OF STAKEHOLDER CONSULTED

SN	NAME (JINA)	INSTITUTION (TAASISI)	POSITION (CHEO)	CONTACT (MAWASILIANO)	SIGNATURE (SAHIHI)	DATE (TAREHE)
01	JAMES NIAMBI	DALA.	M/KIJIJI KITONGOJI	0692337554	[signature]	12/05/2022
02	NULO KYRWA	DALA	MFUGAJI	—	N.K	12/05/2022
03	NJEPA MANDALO	DALA	MFUGAJI	—	N.M	12/05/2022
04	MYOKA YOHANA	DALA	MJUMBE	0688 619337	M. Yoh	12/05/2022
05	KUZENZA HENERICKO	DALA	MFUGAJI	078888 4419	K. H.	12/05/2022

Appendix C: Comments from consulted Stakeholders

CONSULTATION ATTENDANCE

Project name(Jina la mradi): BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO CATCHMENTS

Type of study(Aina ya tafiti): ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Stakeholder's comments(maoni ya mdau) (DEMO – MORO DC)

Wafuggaji washirikeshwe na wadimishwe juu ya faida za utunzaji wa vyanzo vya maji ili mradi uwe na tija na faida kafika jamii husika, ili pia utunzaji wa vyanzo vyanzo vya maji ufanikiwe, ni lazima elimu zote za utunzaji wa mazingira zifuatwe. wakati wote wa utekelezaji wa mradi

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO. SIMU	SIGNATURE SAHIHI
22/09/2023	ROSE SEMIONO	DEMO	MORO DC	0783655810	

CONSULTATION ATTENDANCE

Project name (Jina la mradi) BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGEIA AND MUHA MICRO CATCHMENT

Type of study (Ainaya tafiti) ENVIRONMENTAL IMPACT ASSESSMENT

Stakeholder's comments (maoniyamdau)

Mradi huu wa visima virefu na mabirika ya kunyweshea ng'ombe maji vitasaidia kupunguza migogoro ya wakulima na wafugaji. Pia itaongeza ubora wa nyama kwa sababu mifugo itapunguza kutembea umbali mkubwa kwenda kutafuta maji nakupu nguza uharibifu wa vyanzo vya maji. Vile vile itasaidia jamii nzima inayoizunguka kupata maji ya kutumia kwa matumizi ya nyumbani.. Hivyo Visima virefu na mabiriki yaongezwe ilikuondoa uharibifu wa vyanzo vya maji.

DATE	NAME	TITLE	INSTITUTION	SIGNATURE
23/09/2023	Glory Malata	SLO	Moro-DC	Malata.

CONSULTATION ATTENDANCE

Project name(Jina la mradi)..BOREHOLES AND WATER SUPPLY SYSTEMS CONSTRUCTION IN MGETA AND MVUHA MICRO CATCHMENT.

Type of study(Aina ya tafiti)....ENVIRONMENTAL IMPACT ASSESSMENT

Stakeholder's comments(maoni ya mdau) (DM-TARURA) MORO DC

1. Matumizi mazuri ya barabara yazingatiwe - Mifugo itengewe maeneo maalumu ya kuvuka barabara na siyo kutembea kwenye barabara
2. Mitambo ya kuchimba visima ambayo ni mizito sana, isafirishwe kwa uangalifu ili kuepusha uharibifu wa barabara na mazingira kiujumla.
3. Wafugaji waelimishwe juu ya matumizi sahihi ya barabara na kufuata sheria
4. Maeneo yote ambayo yataathirika na mradi ambayo yapo ndani ya hifadhi ya barabara basi yarudishwe katika hali yake ya kawaida.

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO. SIMU	SIGNATURE SAHIHI
21/9/2023	Eng. Mohamed. A. Mwanda	DM	TARURA	0767235236	[signature]

CONSULTATION ATTENDANCE

Project name(Jina la mradi)...BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA M. CATCHMENT

Type of study(Aina ya tafiti)....ENVIRONMENTAL IMPACT ASSESSMENT

Stakeholder's comments(maoni ya mdau) (TANROADS.)

1. Mizigo Mizito Sana isingefaa kuenye Maeneo yenye Madaraja madogo Sana yasiyoweza kuhimili mizigo Mizito, wakati wa kusafirisha materials ya uchimbaji wa Kisima (visima.)
2. Kuenye Kata (eneo) la Mvuha kuna Madaraja mawili Madogo hivyo wakati wa kusafirisha mizigo mizito katika maeneo hayo. uangalizi uwekwe

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO. SIMU	SIGNATURE SAHIHI
21/9/23	Tareck A. Kyamba	RM	TANROADS	0765055025	[signature]

CONSULTATION ATTENDANCE

Project name(Jina la mradi)..WATER SECTOR SUPPORT PROGRAMME PHASE II (WSSP II)

Type of study(Aina ya tafiti)..ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Stakeholder's comments(maoni ya mdau)

The project is potential as it aim to improve water resources protection and conservation. Assessment of the environmental and social impact have been conducted through consultation of key stakeholders, mitigation measures for the predicted impact was provided.

Implementation of the project will ensure sustainability of water resources

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO. SIMU	SIGNATURE SAHIHI
27/09/2023	Eng BIBIANA ABEL	ENVIRONMENTAL ENGINEER	WAMI/RUVU BASIN WATER BOARD	0769753965	

CONSULTATION ATTENDANCE

Project name(Jina la mradi) BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO CATCHME

Type of study(Aina ya tafiti) ENVIRONMENTAL IMPACT ASSESSMENT

Stakeholder's comments(maoni ya mdau) (FIRE AND RESCUE FORCES)

1. Kulingana na aina yamradi, hakutegemewi kuwa na athari kubwa hasa Ukizingatia mradi utatumia Solar power kama chanzo cha nishati. (~~umeme~~ na sio umeme.
2. Inashauriwa kufungwa kifaa kimoja (fire extinguisher (9kg) kwenye pump house kwa tahadhari.

DATE TAREHE	NAME JINA	TITLE CHEO	INSTITUTION TAASISI	PHONE NO. SIMU	SIGNATURE SAHIHI
21/9/2023	SGT HASSAN NDURU	ESTATE	FIRE & RESCUE FORCE	0712 049 249	

Appendix D: Minutes of the Meetings requesting for the implementation of the prosed project under Water Supply and Sanitation Program (WSSII) – Dalla Village

OFISI YA RAIS-TAMISEMI (2)
HALMASHAURI YA WILAYA YA MOROGORO (3)
KIJIJI CHA DALLA

OFISI YA AFISA MTENDAJI
KIJIJI - DALLA
S.L.P 1880
MOROGORO
13/09/2021

MRATIBU WA MRADI
K:K
MKURUGENZI MTENDAJI (W)
S.L.P 1880
MOROGORO
K:K
AFISA MTENDAJI KATA MVUHA
S.L.P 1880
MOROGORO

Carlos 14/09/2021

AFISA MTENDAJI KATA YA MVUHA

YAH; OMBI LA KUJENGEWA BIRIKA LA KUNYWESHEA MIFUGO

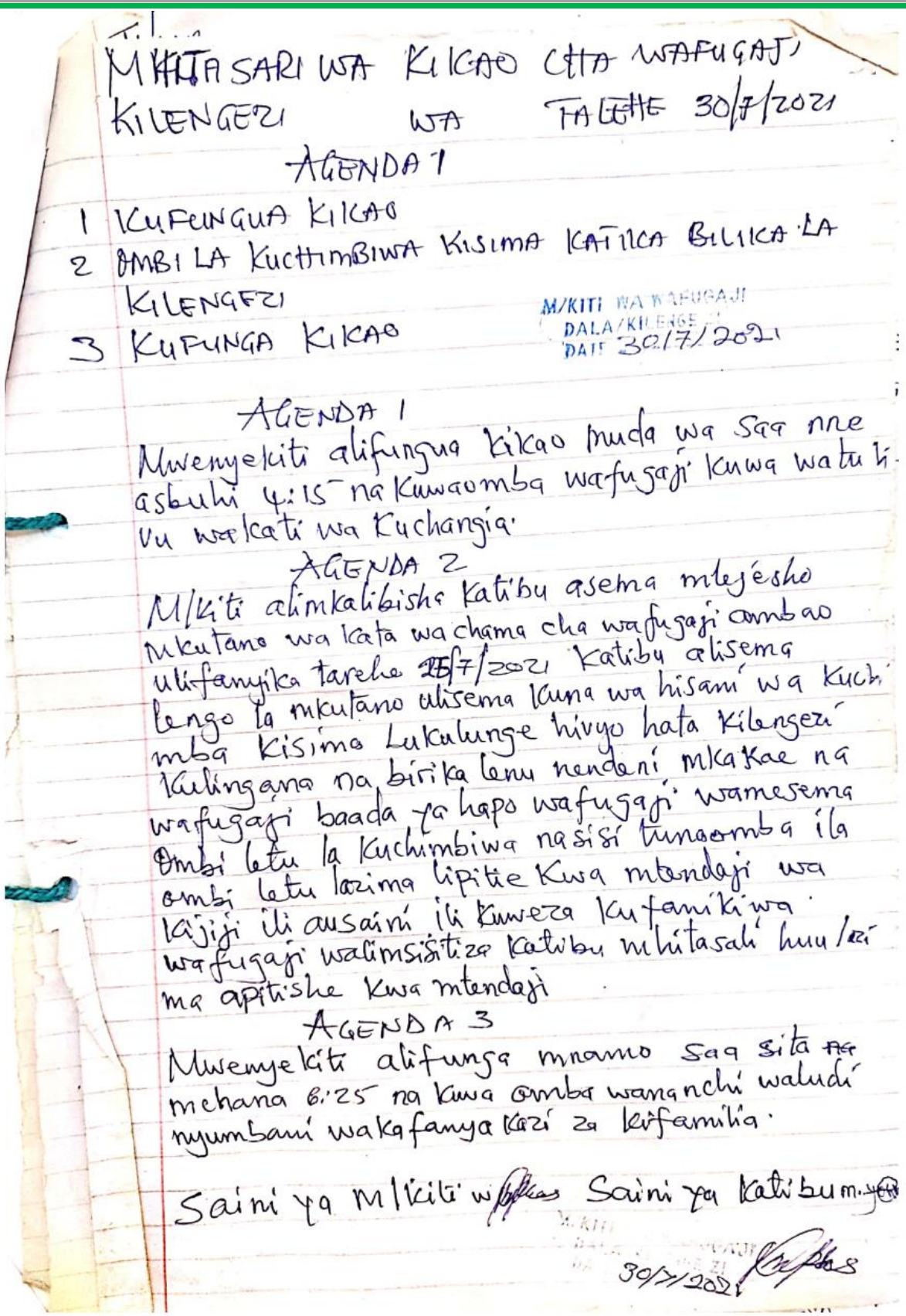
Husika na kichwa cha barua tajwa Wafugaji wa kijiji cha Dalla, kitongoji cha Kilengezi, Wanaomba kujengewa birika la kunywesha mifugo. Baada ya ombi lao kujadiliwa na serikali ya kijiji, na kuli dhaa ombi lalo.

Ni matumaini yetu ombi litapo kelewa na ofisi yako.

Wako katika kazi,

AFISA MTENDAJI KIJIJI CHA DALLA

David A. Bita
0689693754



MKUTANO WA KIKAO CHA WAFUGAJI KILENGEZI WA TAREHE 30/7/2021

AGENDA 1

1 KUFUNGUA KIKAO
2 AMBI LA KUCHIMBIWA KISIMA KATIKA BILIKA LA KILENGEZI
3 KUFUNGA KIKAO

M/KITI WA WAFUGAJI
DALA/KILENGE
DATE 30/7/2021

AGENDA 1
Mwenyekiti alifungua kikao muda wa saa nne asubuhi 4:15 na kuwaomba wafugaji kuwa watu wa Mungu wakati wa kuchangia.

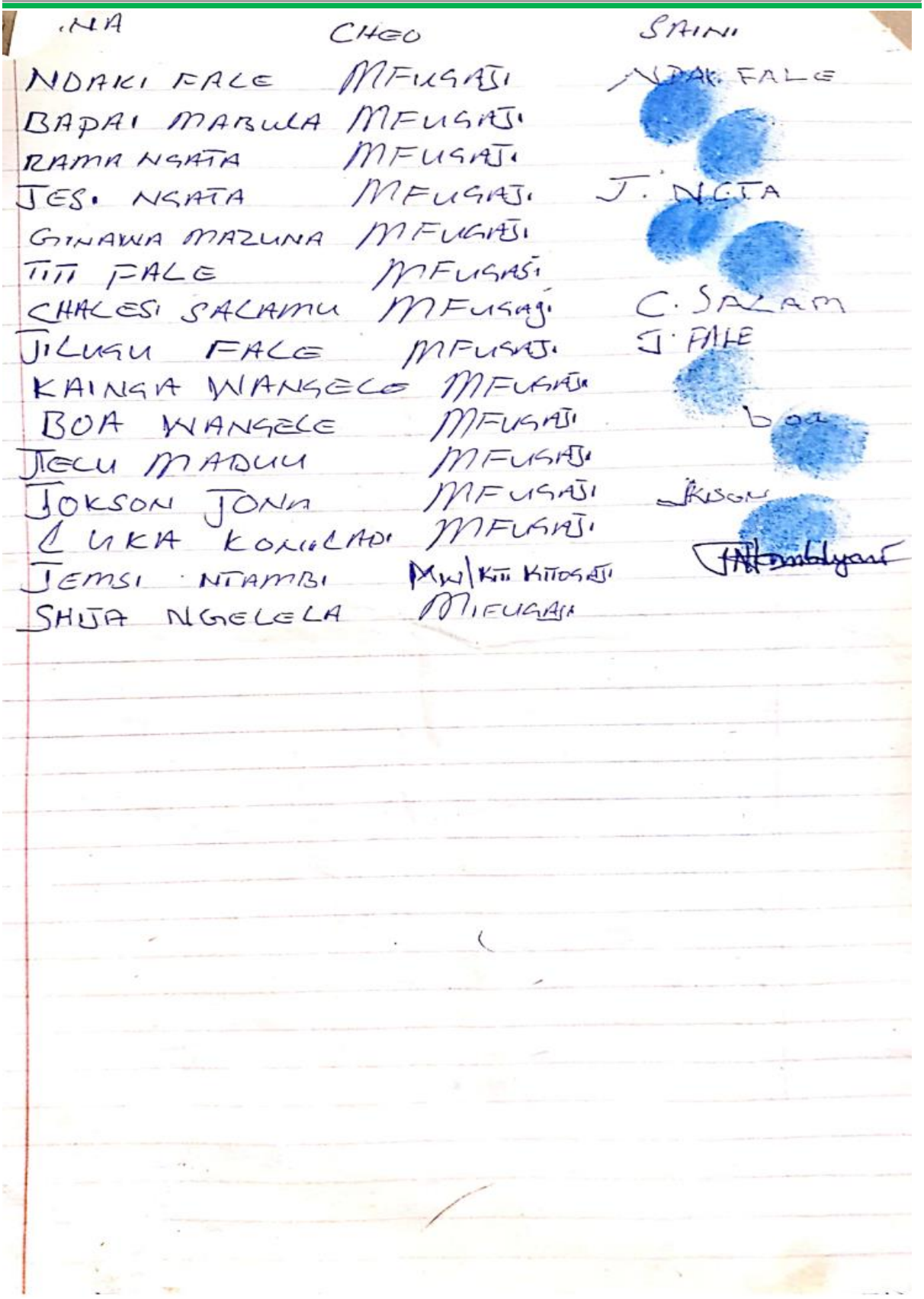
AGENDA 2
M/Kiti alimkaribisha katibu asema mtejesho mkutano wa kata wa chama cha wafugaji ambao ulifanyika tarehe 25/7/2021 Katibu alisema lengo la mkutano ulisema kuna wa hisani wa kuchimba kisima Lukalunge hivyo hata Kilengezi kulingana na birika lenu nendeni mkakae na wafugaji baada ya hapo wafugaji wamesema ambi letu la kuchimbiwa nasisi tunaomba ila ambi letu lazima lipitie kwa mtendaji wa kijiji ili ausaini ili kuweza kufanikiwa wafugaji walimsisitiza katibu mkitasali huu/zi na apitishe kwa mtendaji

AGENDA 3
Mwenyekiti alifunga mnamo saa sita mchana 6:25 na kwa amba wanachi waludi nyumbani wakafanya kazi za kifamilia.

Saini ya M/kiti [signature] Saini ya katibu [signature]

30/7/2021

JINA	CHEO	SAINI
NGWABI BONIFASI	MWANKITI	
MSABAHA NGWENUKI	MAKAMO MKITI	
MYOKA YOHANA	KATIBU	
EMA BULUGU	MFUGAJI	
KUNZENZA ENILIKO	MFUGAJI	
MAHOA HUNDI	MFUGAJI	
MASUTA MASHOVA	MFUGAJI	
KREMENI MAKUBI	MFUGAJI	K. Makubi
MARUNDE MAKUBI	M/KATA MFUGAJI	~~Marde M. Makubi~~ E. MISANA
EMA MISSANA	MFUGAJI	
NJEPA MANOALU	MFUGAJI	
EMA IKOLI	MFUGAJI	E. IKOLI
NKALALILA MASSANJA	MFUGAJI	
CHALES. NOILA	MFUGAJI	C. ndila
MALIMI MUGALAMA	MFUGAJI	
SACHUNGA SALI	MFUGAJI	
SAIDI NGELELA	MFUGAJI	S. ngelela
TEMBO NGELELA	MFUGAJI	
SITA MPALA	MFUGAJI	S. mpala
TABALO MIHANGWA	MFUGAJI	T. MIHANGWA
~~MAKWALIA~~ DIDAMANGEN.	MAKWALIA	
NGELELA LUPUSA	MFUGAJI	
DAYA BUGALAMA	MFUGAJI	D. BUGALAMA
MAKENZI MOCHA	MFUGAJI	
MLOJA GUNDURA	MFUGAJI	
PITA BUNDALA	MFUGAJI	P. bundala
MAIGE LUSESA	MFUGAJI	M LUSESA
JOHN NICHEMBA	MFUGAJI	~~J. NICHEMBA~~
SALAWA JINANGA	MFUGAJI	
JISANDU GULU	MFUGAJI	
SHIJA SHEKA	MFUGAJI	S. Sheka
NUCO KULWA	MFUGAJI	



JINA	CHEO	SAINI
NDAKI FALE	MFUGAJI	NDAK. FALE
BADAI MABULA	MFUGAJI	
RAMA NGATA	MFUGAJI	
JES. NGATA	MFUGAJI	J. NGTA
GINAWA MAZUNA	MFUGAJI	
TITI FALE	MFUGAJI	
CHALESI SALAMU	MFUGAJI	C. SALAM
JILUGU FALE	MFUGAJI	J. FALE
KAINGA WANGELO	MFUGAJI	
BOA WANGELE	MFUGAJI	boa
JECU MADUU	MFUGAJI	
JOKSON JONA	MFUGAJI	JKSON
LUKA KONGLADI	MFUGAJI	
JEMSI NTAMBI	MW/KIT KITOGAJI	
SHIJA NGELELA	MFUGAJI	

Appendix E: Proof of land ownership

(21)

MKATABA WA KURIDHIA KUTOA ARDHI KWA HIARI

MAKUBALIANO

KATI YA

Bw/Bibi. MAHOGO MAGUTA NGALYA

NA

MAMLAKA YA SERIKALI YA KIJIJI

DALA

KWA LENGO LA

KUTOA ARDHI KWA HIARI

MWEZI/MWAKA

23/09/2023

MRADI WA KUSAIDIA SEKTA YA MAJI AWAMU YA PILI (WSSP II)

MKATABA HUUumesainiwa leo Tarehe..23...ya Mwezi...09...Mwaka ...2023

BAINA YA

NDUGUMAHOGO MAGUTA NGALYAwaSanduku la Posta.....18 80....., Kijijicha..DALA....., Wilaya ya MOROGORO Mkoawa..MOROGORO (ambayeatajulikanakama "***MtoaArdhi***"msemoambaoutajumuishawarithiwakekwaupandemmoja);

NA

MTENDAJI WA KIJIJI CHA....DALA..... Sanduku la Posta 1880.. (atakaejulikanakwa jina "***MpokeajiArdhi***") msemoambaoutajumuishawarithiwakekwaupandemwingine).

KWA KUWA MTOA ARDHI ni mmilikihalaliwaeneo/ardhi/kiwanja/shambalenyeukubwawa mita.....,(upanawa mita 20.... naurefuwa mita 20....) lililopokatikaKijijicha ....., Kata ya MUUHA....., Tarafa.....MUUHA.....,Wilaya ya MOROGORO U....., Mkoa MOROGORO. Kwa hiari yake mwenyewe bila kulamizimishwa akiwa na akili timamu ameamua kutoa sehemu ya eneo tajwa katika Mkataba huu kwa **SERIKALI YA KIJIJI CHA** .....DALA..... kwa ajili ya Mradi wa...WSSP....II.

MAELEZO YA AWALI:

Serikali kwa kushirikiana na Wadau wa Maendeleo inatakeleza Programu ya Maendeleo ya Sekta ya Maji nchini (WSDP 2006-2025).MtekelezajiwaProgramuniSerikaliyaJamhuriyaMuunganowa Tanzania ambayoimetoajukumuhilokwa Wizaraya Maji.

Wananchi wa maeneo yote yatakayopitiwa na Mradi huo wa maji kwa pamoja na kwa hiari yao na kwa lengo la kuwezesha utekelezaji wa mradi huo kwa manufaa ya umma, wamekubali kutoa ardhi zao kwa Serikali ya Kijiji husika itakayotumika kwa ajili ya utekelezaji wa mradi huo.

HIVYO BASI pande zote mbili zinashuhudia na kukubaliana kama ifuatavyo:-

1. **KWAMBA** Mtoa Ardhi kwa hiari yake mwenyewe anaridhia kutoa eneo/shamba/kiwanja tajwa katika mkataba huu kwa ajili ya kuwezesha mradi wa ...WSSP....II.....

2. **KWAMBA** Mpokea Ardhi atatumia eneo analopewa kwa ajili ya kujenga miundombinu ya mradi wa usambazaji maji na si kwa matumizi mengine

3. **KWAMBA** Mtoaji Ardhi hatoruhusiwa kufanya shughuli yoyote ya kudumu ambayo itahatarisha uwepo wa miundombinu ya mradi kwa ujumla katika maeneo yote kama vile kujenga Nyumba na kupanda miti mikubwa.

4. **KWAMBA** Mtoa Ardhi ambaye eneo lake lina miundombinu ya kudumu ambayo itaharibiwa kwa namna moja ama nyingine na ujenzi wa mradi atalipwa kwa utaratibu utakaoelekezwa kutokana na uthamini utakaofanyika.

5. **KWAMBA** Mtoaji Ardhi anahakikisha kuwa ardhi aliyotoa kwa ajili ya mradi ni mali yake mwenyewe na hakuna mtu mwingine mwenye umiliki na eneo hilo na endapo atatokea mwingine kudai umiliki wa eneo hilo na ikathibitika kuwa ndiye mmiliki halali wa eneo hilo,basi mtoa ardhi atakuwa na jukumu la kulipa fidia kwa mtu huyo.

6. **KWAMBA** mkataba huu utasimamiwa na Sheria ya Mkataba ya Jamhuri ya Muungano wa Tanzania.

KAMA USHUHUDA kuwa **MTOA ARDHI** na **MPOKEA ARDHI** wamekubaliana na masharti ya Mkataba huu kwa hiari yao wenyewe wamesaini mkataba huu Tarehe 23 Mwezi 09 Mwaka 2023 kama inavyoonekana hapa chini:

MTOA ARDHI:

JINA: MAHOGO MAGUTA NGALYA

SAINI: .....

CHEO: MTOA ARDHI

TAREHE: 23/09/2023
0789377113

SHAHIDI WA MTOA ARDHI:

JINA: MIHOKA YOHANA MBUSIKI

SAINI: .....

CHEO: SHAHIDI

TAREHE: 23/09/2023
0688619337

MBELE YA MWENYEKITI WA KIJIJI:

JINA. KADIKI OMARI KAVAIU

SAINI.....

CHEO. MWENYEKITI

TAREHE: 23/9/2023

MPOKEA ARDHI

KWA NIABA YA SERIKALI YA KIJIJI:MBELE YA MWAKILISHI WA HALMASHAURI:

JINA: AICLET PASKAL LWAMA   JINA: IRENE PASCAL LYAMUYA

SAINI: ...   SAINI: ...

CHEO: VEO   CHEO: MWANASHERIA (W)

TAREHE: 23/09/2023   TAREHE: 23/09/2023

MWANASHERIA (W) HALMASHAURI YA WILAYA MOROGORO

MBELE YA MWAKILISHI WA WIZARA YA MAJI (BONDE LA WAMI/RUVU):

JINA: ELIBARIKI MMALLY

SAINI: ...

CHEO: MKURUGENZI

TAREHE: 12/12/2023.

MKURUGENZI
BODI YA MAJI
BONDE LA WAMI/ RUVU
S.L.P 826
MOROGORO

MKATABA WA KURIDHIA KUTOA ARDHI KWA HIARI

MAKUBALIANO

KATI YA

Bw/Bibi. KUZENZA HENELIKO MIZA

NA

MAMLAKA YA SERIKALI YA KIJIJI

DALLA

KWA LENGO LA

KUTOA ARDHI KWA HIARI

MWEZI/MWAKA

23/09/2023

MRADI WA KUSAIDIA SEKTA YA MAJI AWAMU YA PILI (WSSP II)

MKATABA HUUumesainiwa leo Tarehe..22...ya Mwezi..09....Mwaka .2023....

BAINA YA

NDUGUKUZENZA HENELIKO MIZA.waSanduku la Posta.....1640....., Kijijicha....DALA..., Wilaya ya MOROGORO Mkoawa.MOROGORO (ambayeatajulikanakama "***MtoaArdhi***"msemoambaoutajumuishawarithiwakekwaupandemmoja);

NA

MTENDAJI WA KIJIJI CHA....DALA.... Sanduku la Posta 1640 (atakaejulikanakwa jina "***MpokeajiArdhi***") msemoambaoutajumuishawarithiwakekwaupandemwingine).

KWA KUWA MTOA ARDHI ni mmilikihalaliwaeneo/ardhi/kiwanja/shambalenyeukubwawa mita.....,(upanawa mita 20.... naurefuwa mita 20....) lililopokatikaKijijicha ..DALA....., Kata ya .MUHA....., Tarafa....MUHA.....,Wilaya ya MOROGORO V....., Mkoa ..MOROGORO Kwa hiari yake mwenyewe bila kulamizimishwa akiwa na akili timamu ameamua kutoa sehemu ya eneo tajwa katika Mkataba huu kwa **SERIKALI YA KIJIJI CHA** .....DALA..... kwa ajili ya Mradi wa..W.S.S.P...II....

MAELEZO YA AWALI:

Serikali kwa kushirikiana na Wadau wa Maendeleo inatakeleza Programu ya Maendeleo ya Sekta ya Maji nchini (WSDP 2006-2025).MtekelezajiwaProgramuniSerikaliyaJamhuriyaMuunganowa Tanzania ambayoimetoajukumuhilokwaWizaraya Maji.

Wananchi wa maeneo yote yatakayopitiwa na Mradi huo wa maji kwa pamoja na kwa hiari yao na kwa lengo la kuwezesha utekelezaji wa mradi huo kwa manufaa ya umma, wamekubali kutoa ardhi zao kwa Serikali ya Kijiji husika itakayotumika kwa ajili ya utekelezaji wa mradi huo.

HIVYO BASI pande zote mbili zinashuhudia na kukubaliana kama ifuatavyo:-

1. **KWAMBA** Mtoa Ardhi kwa hiari yake mwenyewe anaridhia kutoa eneo/shamba/kiwanja tajwa katika mkataba huu kwa ajili ya kuwezesha mradi wa ...W.S.S.P....II.....

2. **KWAMBA** Mpokea Ardhi atatumia eneo analopewa kwa ajili ya kujenga miundombinu ya mradi wa usambazaji maji na si kwa matumizi mengine

3. **KWAMBA** Mtoaji Ardhi hatoruhusiwa kufanya shughuli yoyote ya kudumu ambayo itahatarisha uwepo wa miundombinu ya mradi kwa ujumla katika maeneo yote kama vile kujenga Nyumba na kupanda miti mikubwa.

4. **KWAMBA** Mtoa Ardhi ambaye eneo lake lina miundombinu ya kudumu ambayo itaharibiwa kwa namna moja ama nyingine na ujenzi wa mradi atalipwa kwa utaratibu utakaoelekezwa kutokana na uthamini utakaofanyika.

5. **KWAMBA** Mtoaji Ardhi anahakikisha kuwa ardhi aliyotoa kwa ajili ya mradi ni mali yake mwenyewe na hakuna mtu mwingine mwenye umiliki na eneo hilo na endapo atatokea mwingine kudai umiliki wa eneo hilo na ikathibitika kuwa ndiye mmiliki halali wa eneo hilo,basi mtoa ardhi atakuwa na jukumu la kulipa fidia kwa mtu huyo.

6. **KWAMBA** mkataba huu utasimamiwa na Sheria ya Mkataba ya Jamhuri ya Muungano wa Tanzania.

KAMA USHUHUDA, kuwa **MTOA ARDHI** na **MPOKEA ARDHI** wamekubaliana na masharti ya Mkataba huu kwa hiari yao wenyewe wamesaini mkataba huu Tarehe 23 Mwezi 09 Mwaka 2023 kama inavyoonekana hapa chini:

MTOA ARDHI:

JINA: KUZENZA HENELIKO MIZA

SAINI: .....

CHEO: MTOA ARDHI

TAREHE: 23/09/2023
0788884419

SHAHIDI WA MTOA ARDHI:

JINA: NULO KURWA MBOJE

SAINI: .....

CHEO: SHAHIDI

TAREHE: 23/09/2023
0686652249

MBELE YA MWENYEKITI WA KIJIJI:

JINA: KADIRI OMARI VAVAYU

SAINI: .....

CHEO: MWENYEKITI

TAREHE: 23/9/2023
0788830666

MPOKEA ARDHI

KWA NIABA YA SERIKALI YA KIJIJI:MBELE YA MWAKILISHI WA HALMASHAURI:

JINA: AKLI BAKARI MKOMA

SAINI: .....

CHEO: VEO

TAREHE: 23/09/2023

JINA: IRENE PASCAL LYAMUYA

SAINI: .....

CHEO: MWANASHERIA

TAREHE: 23/09/2023

MWANASHERIA (W)
HALMASHAURI YA WILAYA MOROGORO

MBELE YA MWAKILISHI WA WIZARA YA MAJI (BONDE LA WAMI/RUVU):

JINA: ELIBARIKI NNASSY

SAINI: .....

CHEO: MKURUGENZI

TAREHE: 12/12/2023

MKURUGENZI
BODI YA MAJI
BONDE LA WAMI/ RUVU
S.L.P 826
MOROGORO

Appendix F: Engineering Drawings of the proposed project

PROJECT: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.

PRELIMINARY ENGINEERING DRAWINGS FOR LOT 1.

DAKAWA (SUKUMA GROUP), MBWADE (MISUFINI), DALLA (KILENGEZI), BWAKILA CHINI (UMASAINI), BWAKILA CHINI (USUKUMANI), KONGWA (LUKOONI) AND KONGWA (KIWANJA CHA NDEGE).

ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024

Consultant:

EDGE ENGINEERING AND CONSULTING LTD.

Edge Engineering and Consulting Limited
Plot No. 412, Block C, Ushindi Street
P.O. Box 24520
Mikocheni B, Dar es Salaam
(+255)763 499 997 info@edgeec.co.tz

In Joint Venture with;

Beyond Nature Limited
P.O. Box 31178
Dar es Salaam, Tanzania
Tel: +255 789 289074
Email: info@beyond.co.tz

MULTI-TECH CONSULT (PTY) LTD

Multi-Tech Consult (PYT) Limited
Plot No. 171, Unit 15
Gaborone Intern Commerce Park
P. O. Box 25462
Gaborone, Botswana

Date:July, 2022.

PROJECT: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.

PUMPING AND SUPPLYING MAINS.

ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN...LHK... DATE...20/12/2024

Consultant:

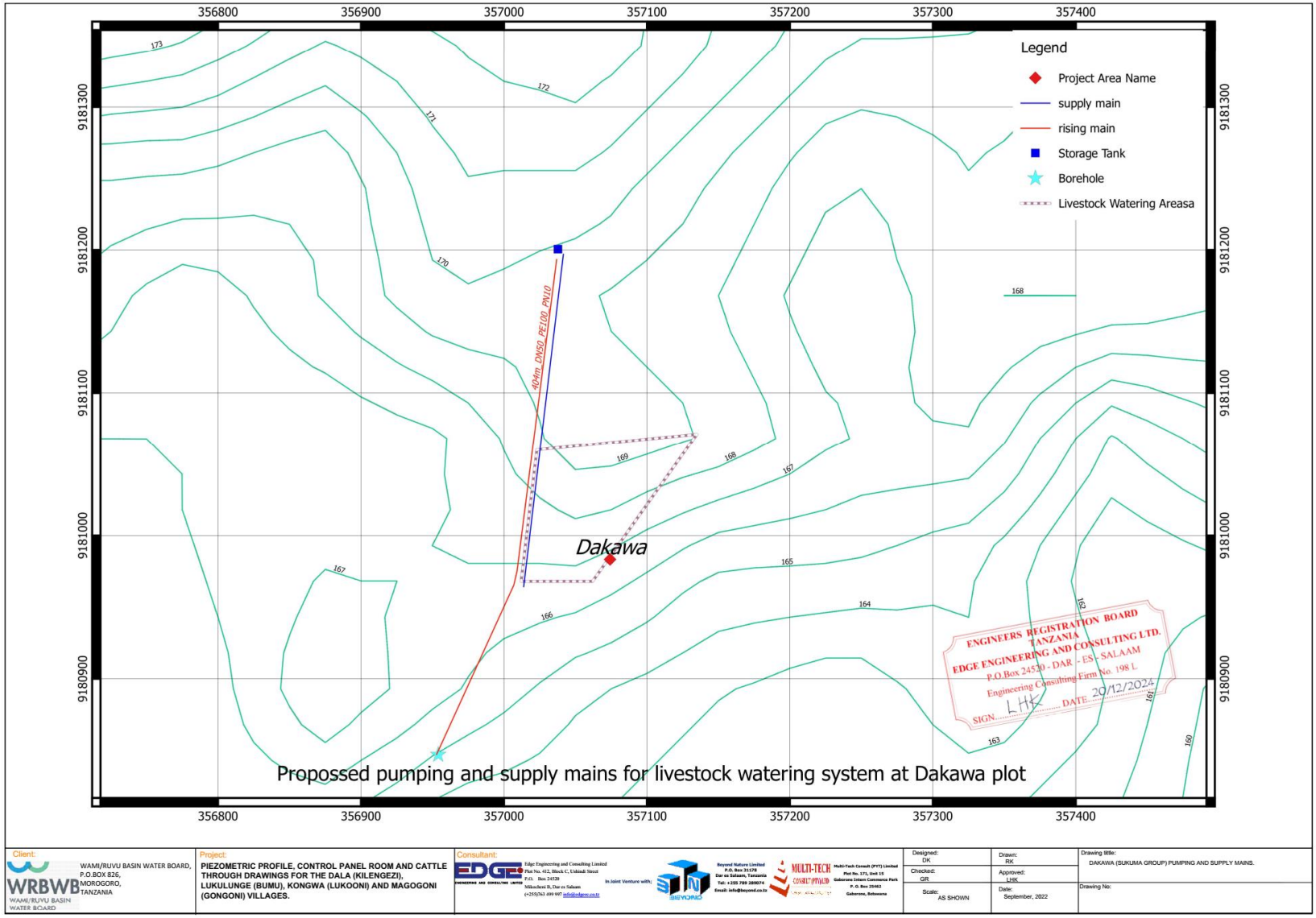
ENGINEERING AND CONSULTING LTD.
Edge Engineering and Consulting Limited
Plot No. 412, Block C, Ushindi Street
P.O. Box 24520
Mikocheni B, Dar es Salaam
(+255)763 499 997 info@edgeec.co.tz

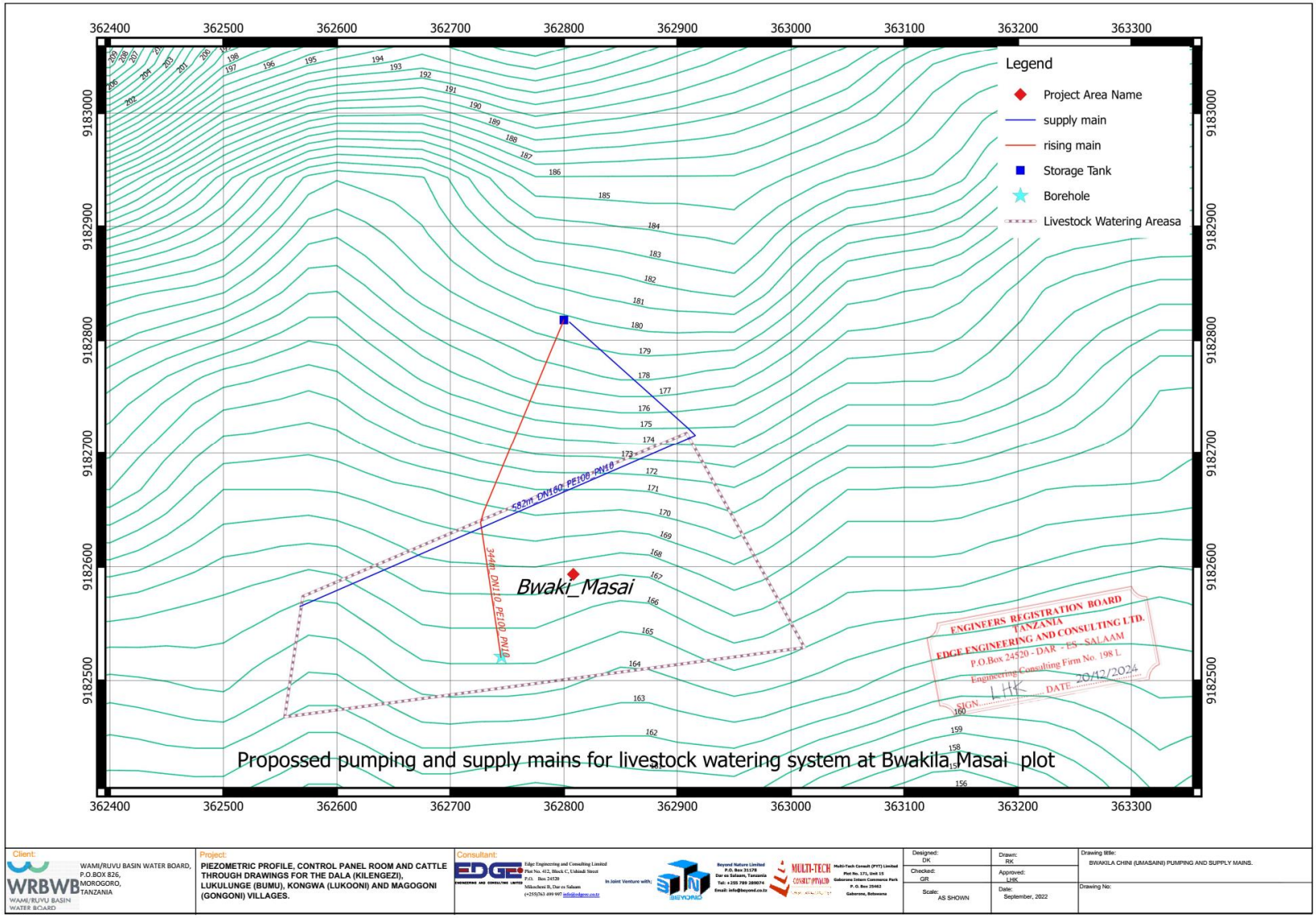
In Joint Venture with;

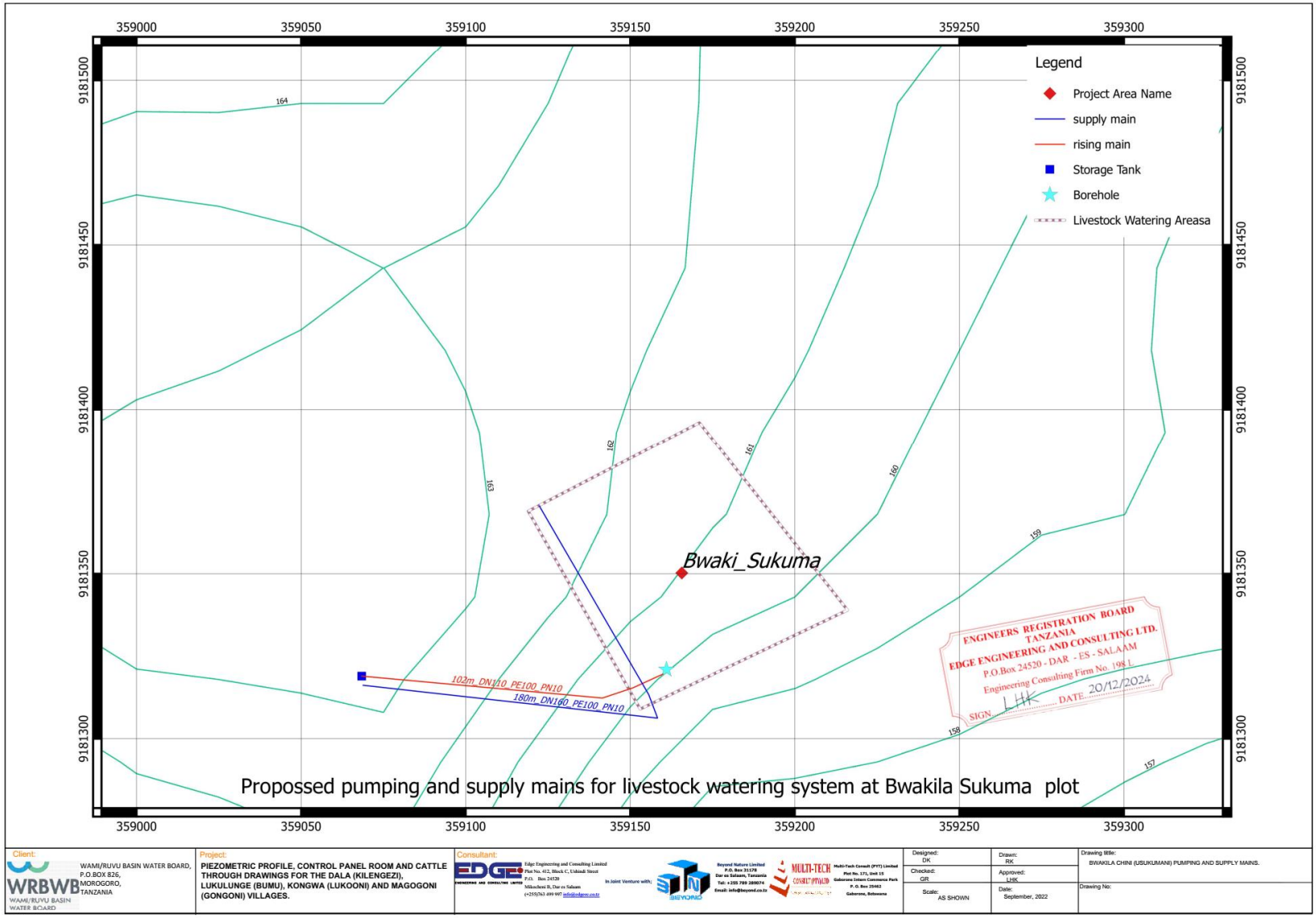
Beyond Nature Limited
P.O. Box 31178
Dar es Salaam, Tanzania
Tel: +255 789 289074
Email: info@beyond.co.tz

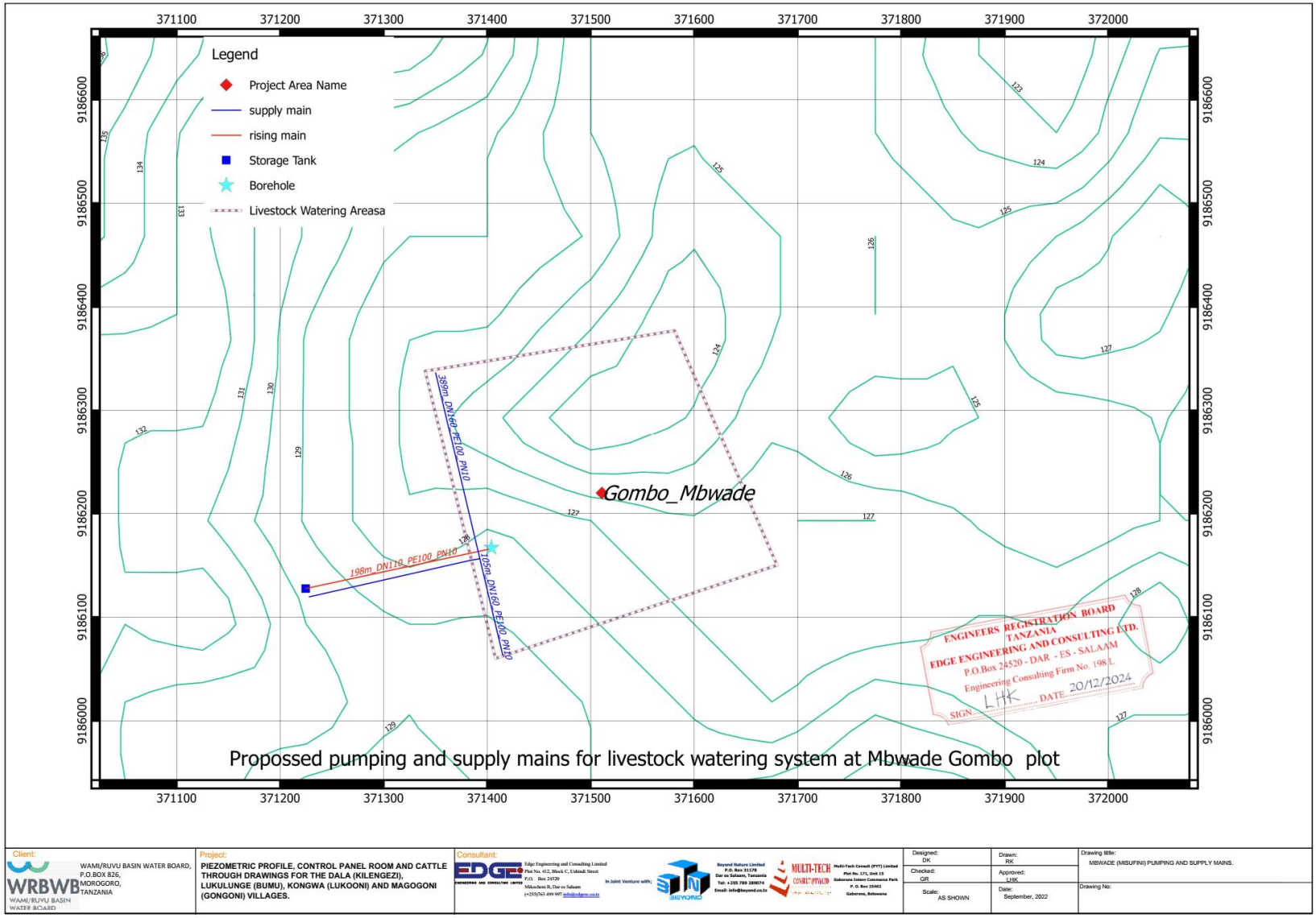
MULTI-TECH CONSULT (PTY) LTD
Multi-Tech Consult (PYT) Limited
Plot No. 171, Unit 15
Gaborone Intern Commerce Park
P. O. Box 25462
Gaborone, Botswana

Date:July, 2022.


356800
356900
357000
357100
357200
357300
357400
9181300
9181200
9181100
9181000
9180900
Legend
Project Area Name
supply main
rising main
Storage Tank
Borehole
Livestock Watering Areasa
404m_DN50_PE100_PN10
Dakawa
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Propossed pumping and supply mains for livestock watering system at Dakawa plot
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: September, 2022
Drawing title:
DAKAWA (SUKUMA GROUP) PUMPING AND SUPPLY MAINS.
Drawing No:


Legend
Project Area Name
supply main
rising main
Storage Tank
Borehole
Livestock Watering Areasa
582m DN180 PE100 PN10
344m DN110 PE100 PN10
Bwaki_Masai
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN..... DATE 20/12/2024
Propossed pumping and supply mains for livestock watering system at Bwakila Masai plot
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing Title: BWAKILA CHINI (UMASAINI) PUMPING AND SUPPLY MAINS.
Drawing No:


359000
359050
359100
359150
359200
359250
359300
9181500
9181450
9181400
9181350
9181300
Legend
Project Area Name
supply main
rising main
Storage Tank
Borehole
Livestock Watering Areasa
164
163
162
161
160
159
158
157
Bwaki_Sukuma
102m_DN110_PE100_PN10
180m_DN160_PE100_PN10
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Propossed pumping and supply mains for livestock watering system at Bwakila Sukuma plot
Client:
WAMI/RUVU BASIN WATER BOARD,
P.O BOX 826,
MOROGORO,
TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing title:
BWAKILA CHINI (USUKUMANI) PUMPING AND SUPPLY MAINS.
Drawing No:


Legend
Project Area Name
supply main
rising main
Storage Tank
Borehole
Livestock Watering Areasa
Gombo_Mbwade
389m DN160 PE100 PN10
198m DN110 PE100 PN10
105m DN160 PE100 PN10
371100
371200
371300
371400
371500
371600
371700
371800
371900
372000
9186600
9186500
9186400
9186300
9186200
9186100
9186000
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Propossed pumping and supply mains for livestock watering system at Mbwade Gombo plot
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
In Joint Venture with;
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing title: MBWADE (MISUFINI) PUMPING AND SUPPLY MAINS.
Drawing No:

PROJECT: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.

PIEZOMETRIC PROFILE.

Consultant:

EDGE ENGINEERING AND CONSULTING LTD.

Edge Engineering and Consulting Limited
Plot No. 412, Block C, Ushindi Street
P.O. Box 24520
Mikocheni B, Dar es Salaam
(+255)763 499 997 info@edgeec.co.tz

In Joint Venture with;

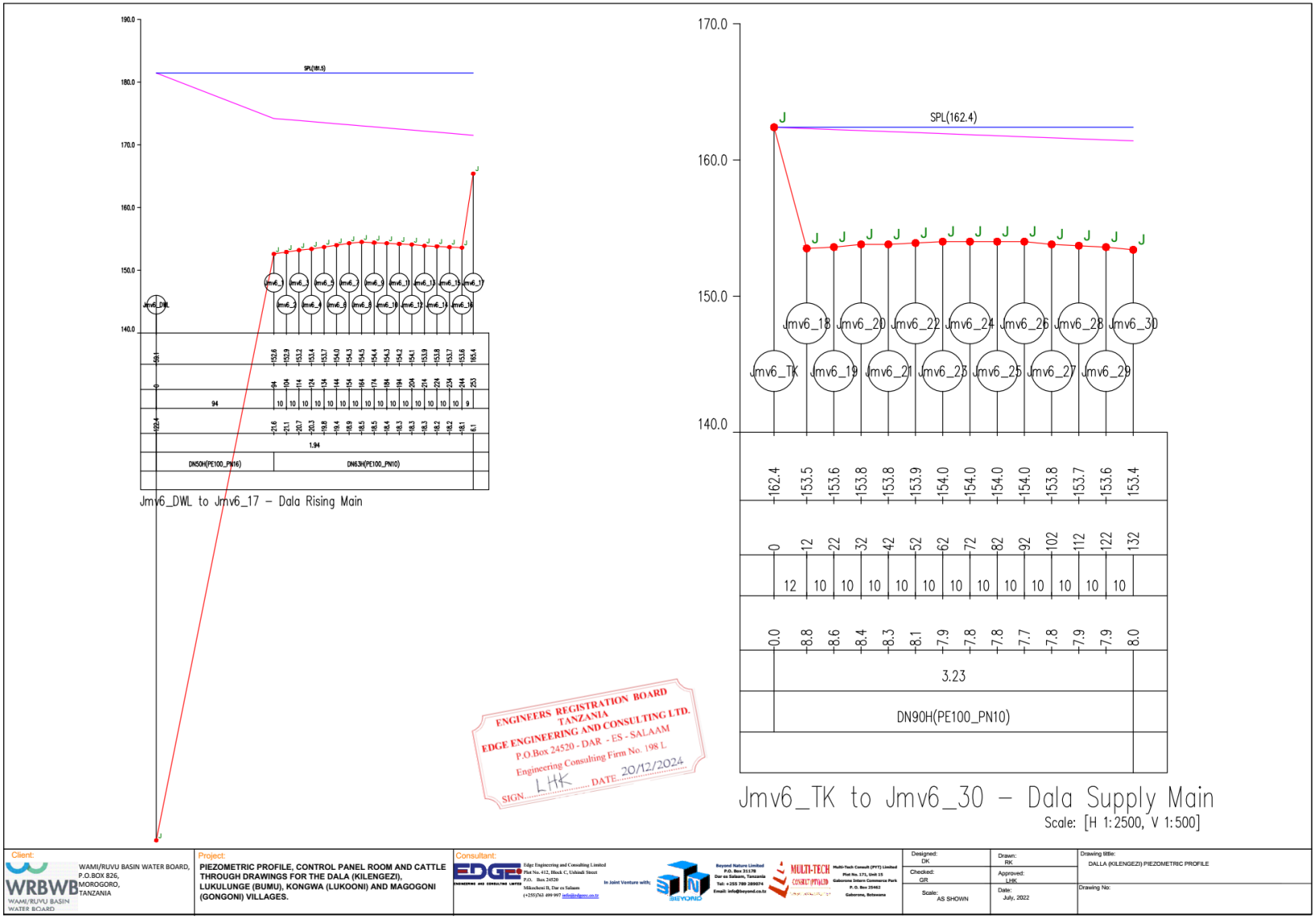
Beyond Nature Limited
P.O. Box 31178
Dar es Salaam, Tanzania
Tel: +255 789 289074
Email: info@beyond.co.tz

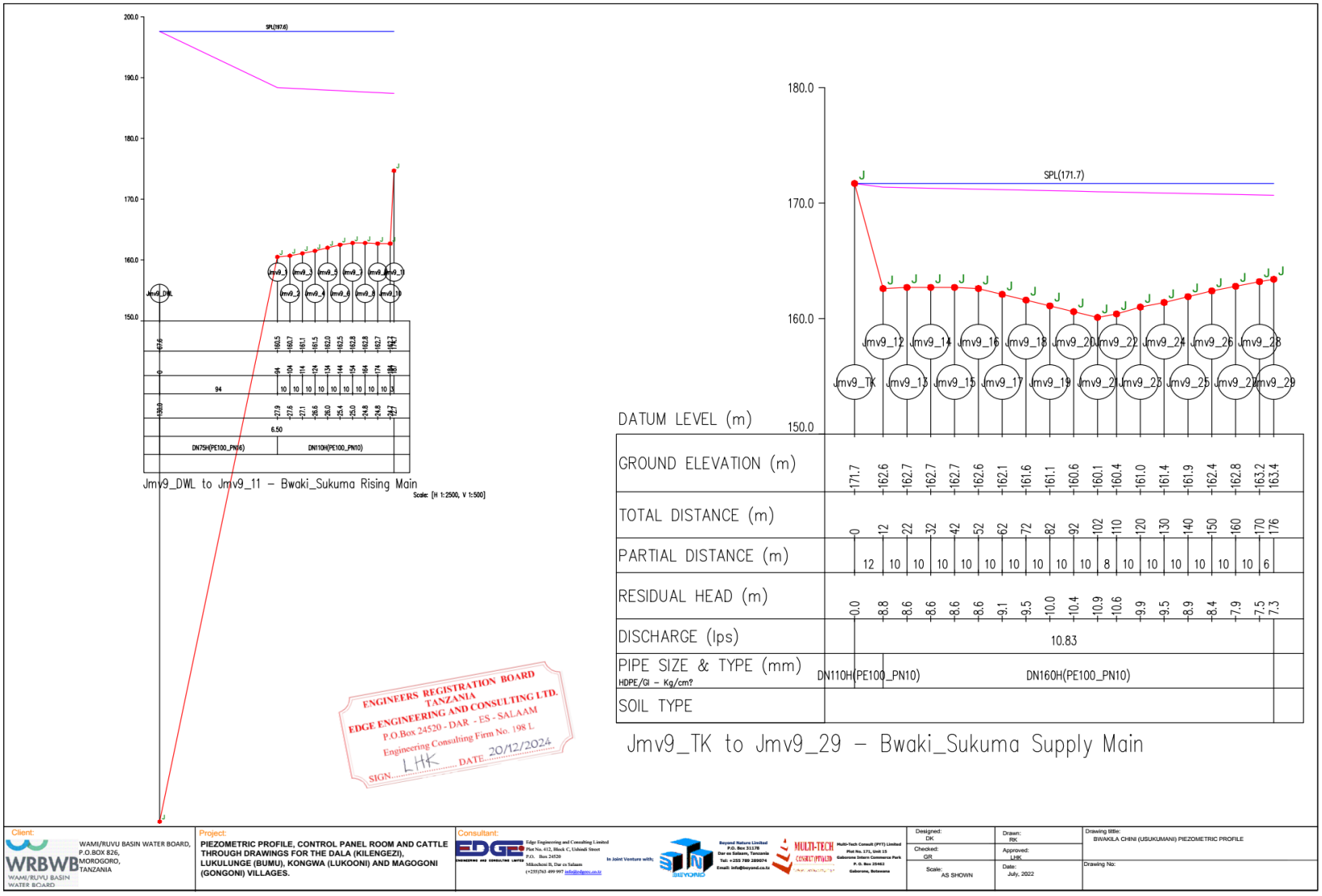
MULTI-TECH CONSULT (PTY) LTD

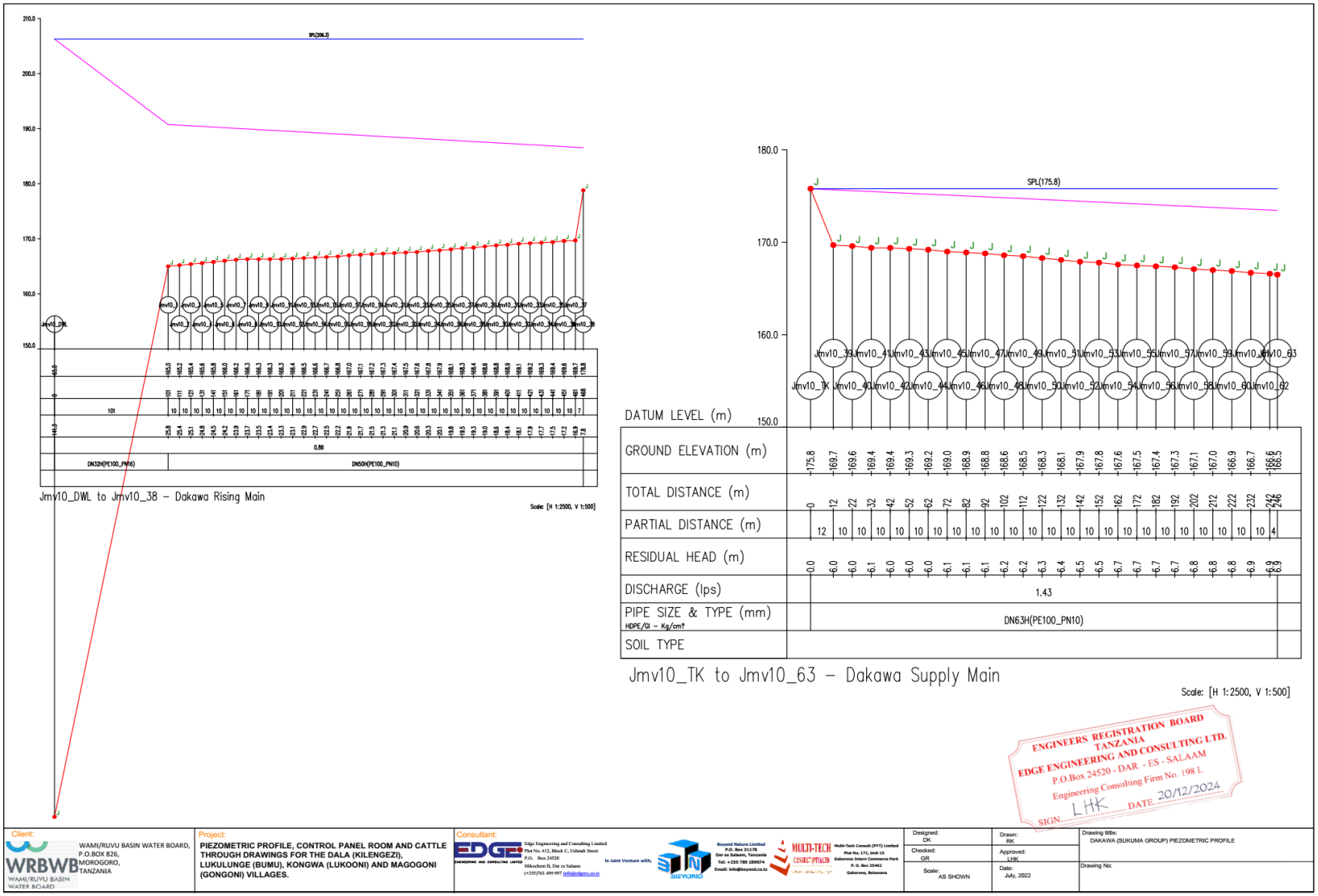
Multi-Tech Consult (PYT) Limited
Plot No. 171, Unit 15
Gaborone Intern Commerce Park
P. O. Box 25462
Gaborone, Botswana

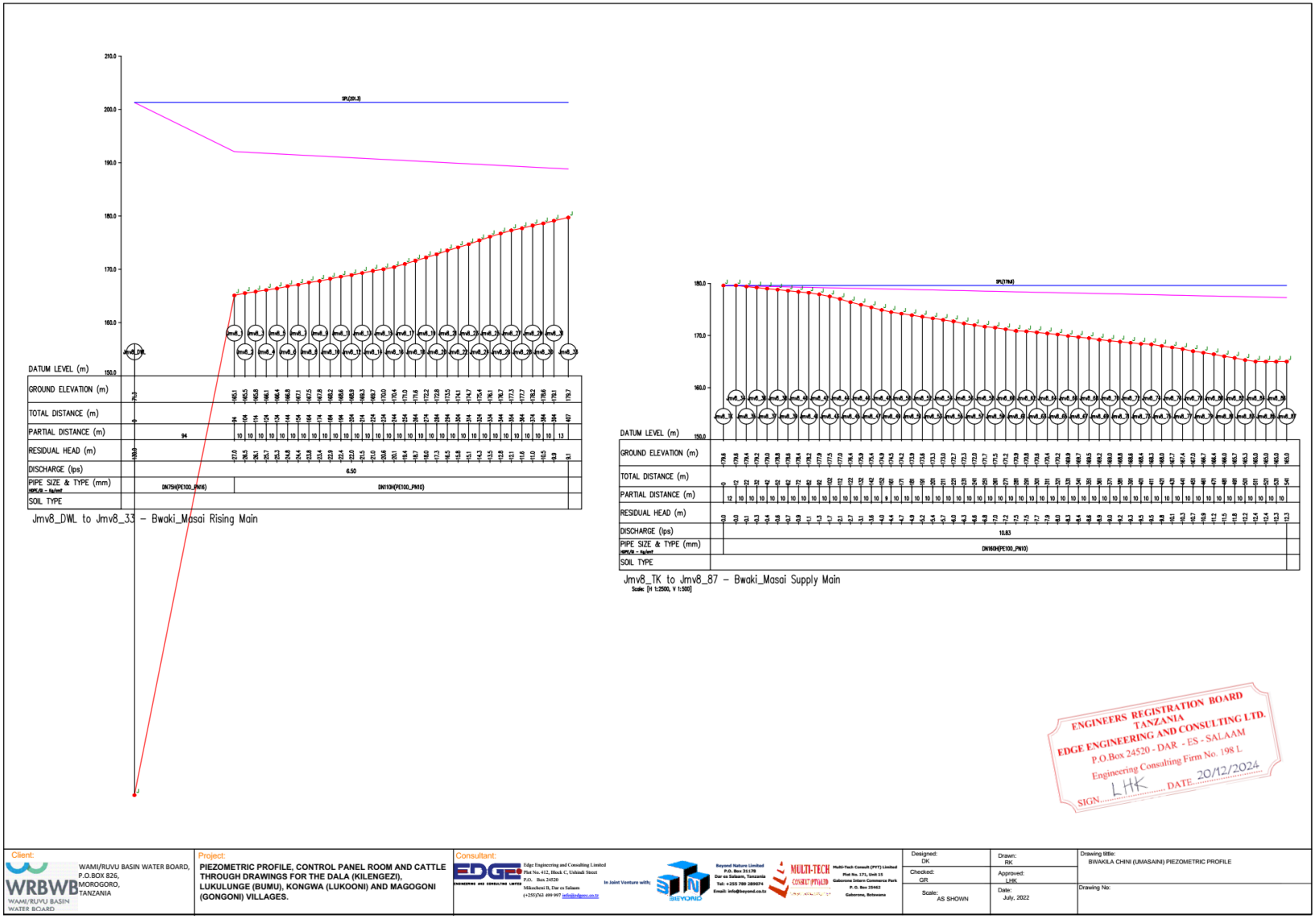
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024

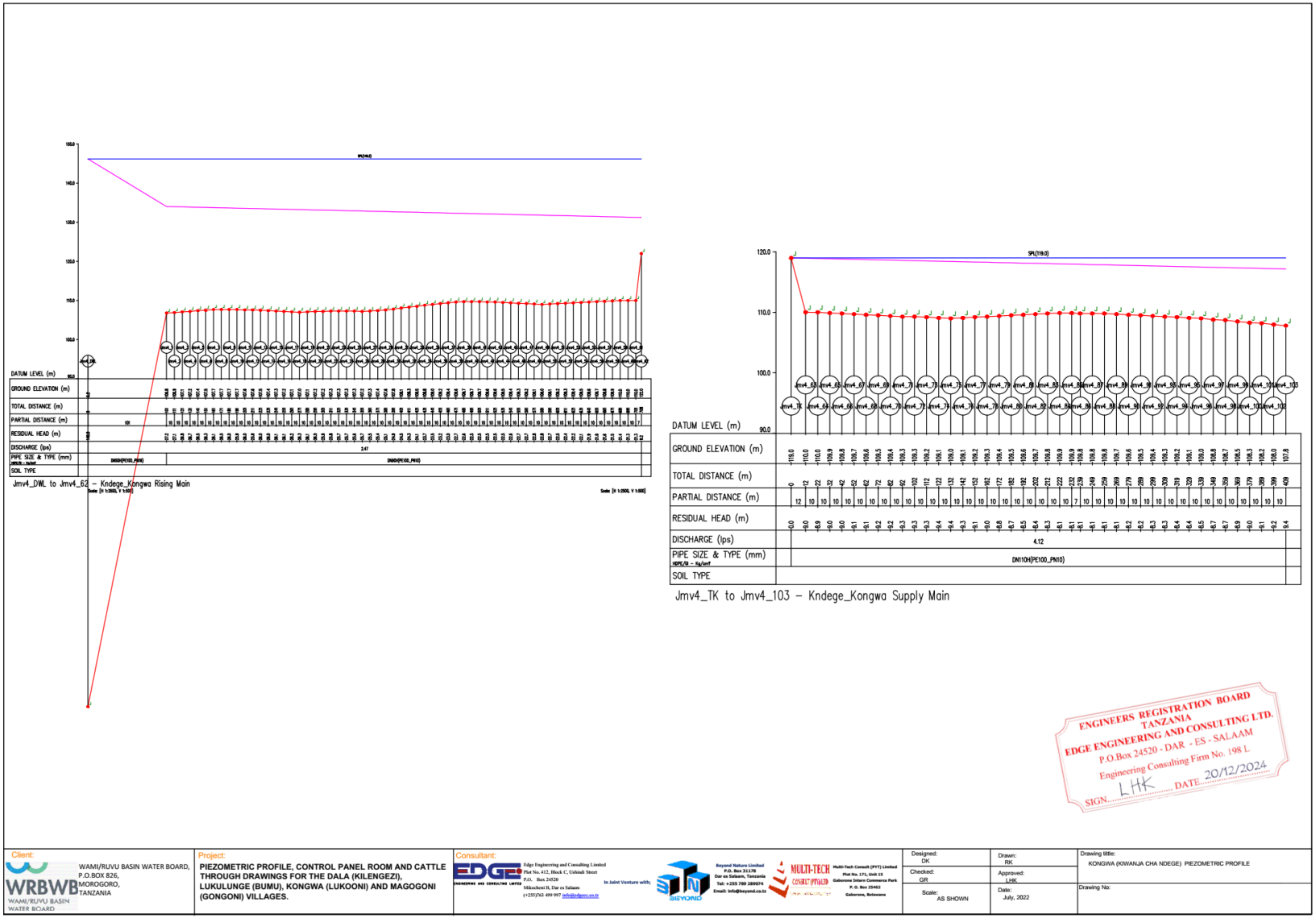
Date:July, 2022.

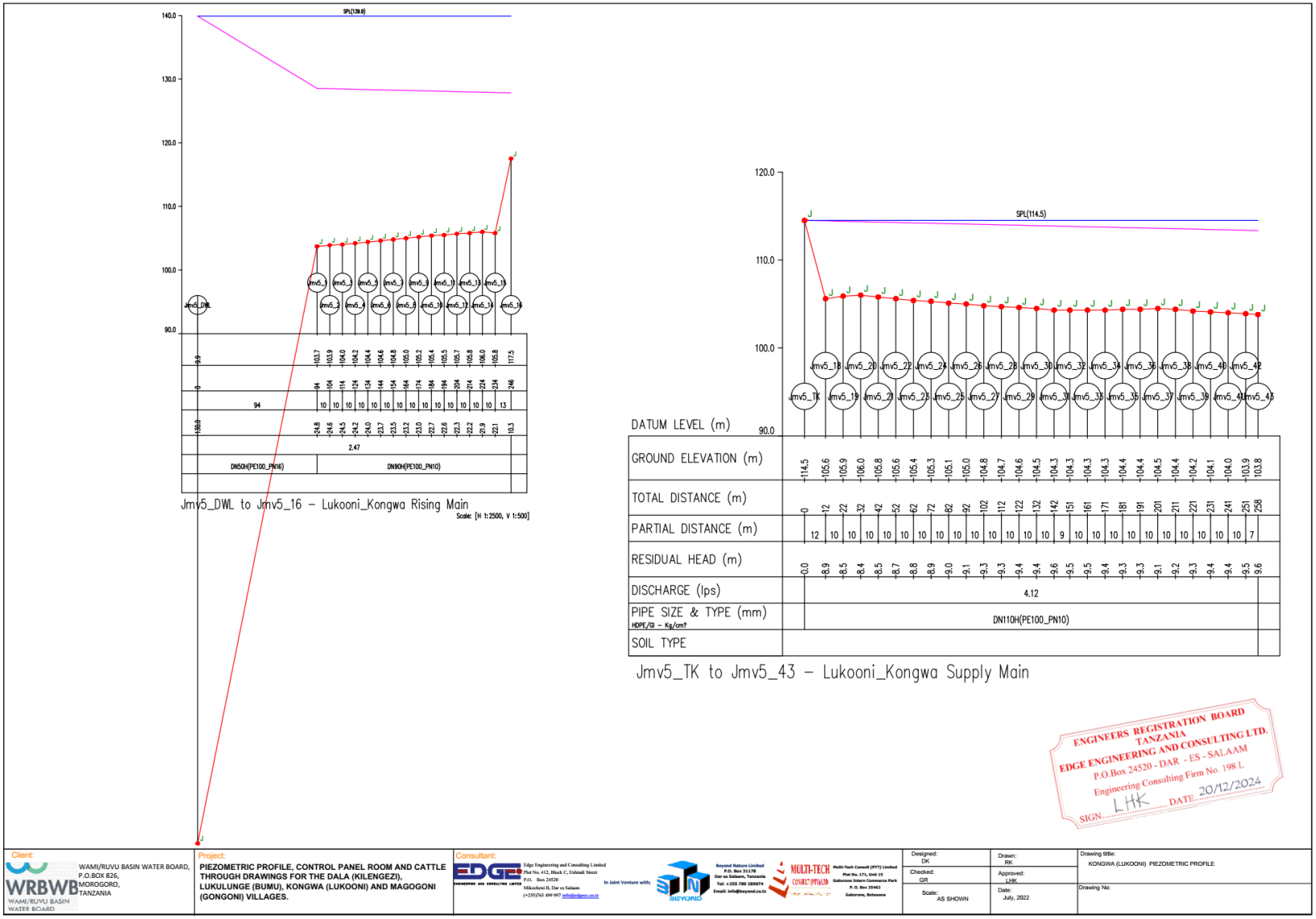

SPL(181.5)
Jmv6_DWL to Jmv6_17 – Dala Rising Main
DN50H(PE100_PN16)
DN63H(PE100_PN10)
SPL(162.4)
Jmv6_TK to Jmv6_30 – Dala Supply Main
Scale: [H 1:2500, V 1:500]
DN90H(PE100_PN10)
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title: DALLA (KILENGEZI) PIEZOMETRIC PROFILE
Drawing No:

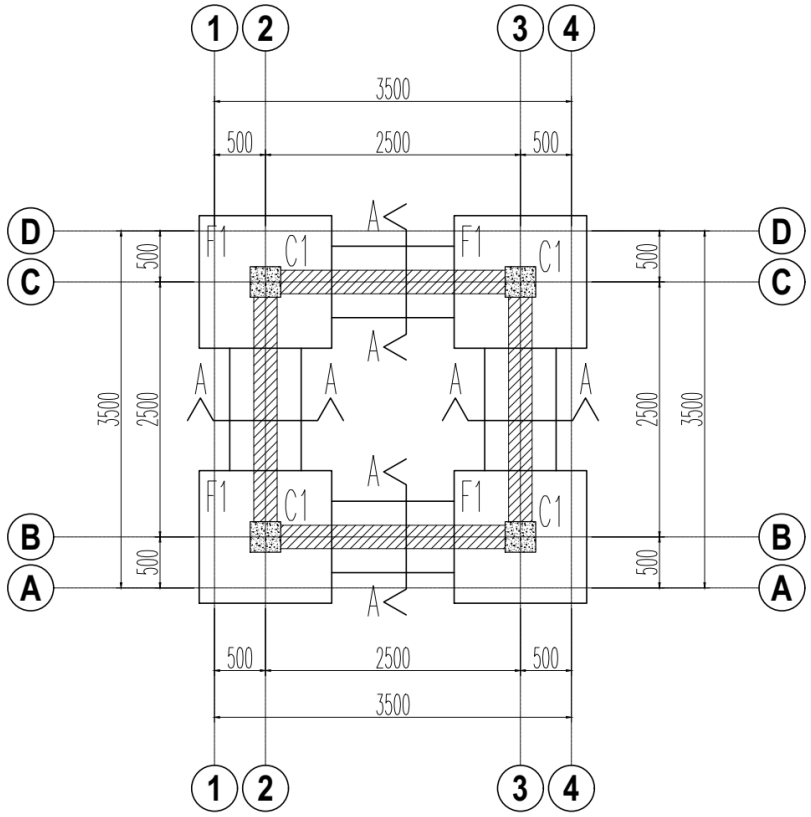

SPL(197.6)
Jmv9_DWL
Jmv9_1
Jmv9_2
Jmv9_3
Jmv9_4
Jmv9_5
Jmv9_6
Jmv9_7
Jmv9_8
Jmv9_9
Jmv9_10
Jmv9_11
94
6.50
DN75H(PE100_PN16)
DN110H(PE100_PN10)
Jmv9_DWL to Jmv9_11 – Bwaki_Sukuma Rising Main
Scale: [H 1:2500, V 1:500]
SPL(171.7)
Jmv9_TK
Jmv9_13
Jmv9_14
Jmv9_15
Jmv9_16
Jmv9_17
Jmv9_18
Jmv9_19
Jmv9_20
Jmv9_21
Jmv9_22
Jmv9_23
Jmv9_24
Jmv9_25
Jmv9_26
Jmv9_27
Jmv9_28
Jmv9_29
DATUM LEVEL (m)
GROUND ELEVATION (m)
TOTAL DISTANCE (m)
PARTIAL DISTANCE (m)
RESIDUAL HEAD (m)
DISCHARGE (lps)
10.83
PIPE SIZE & TYPE (mm)
HDPE/GI – Kg/cm²
DN110H(PE100_PN10)
DN160H(PE100_PN10)
SOIL TYPE
Jmv9_TK to Jmv9_29 – Bwaki_Sukuma Supply Main
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title: BWAKILA CHINI (USUKUMANI) PIEZOMETRIC PROFILE
Drawing No:


SPL(206.3)
Jmv10_DWL to Jmv10_38 – Dakawa Rising Main
Scale: [H 1:2500, V 1:500]
SPL(175.8)
DATUM LEVEL (m)
GROUND ELEVATION (m)
TOTAL DISTANCE (m)
PARTIAL DISTANCE (m)
RESIDUAL HEAD (m)
DISCHARGE (lps)
1.43
PIPE SIZE & TYPE (mm)
HDPE/Gi – Kg/cm²
DN63H(PE100_PN10)
SOIL TYPE
Jmv10_TK to Jmv10_63 – Dakawa Supply Main
Scale: [H 1:2500, V 1:500]
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
In Joint Venture with:
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: July, 2022
Drawing title: DAKAWA (SUKUMA GROUP) PIEZOMETRIC PROFILE
Drawing No:


Jmv8_DWL to Jmv8_33 – Bwaki_Masai Rising Main
Jmv8_TK to Jmv8_87 – Bwaki_Masai Supply Main
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title: BWAKILA CHINI (UMASAINI) PIEZOMETRIC PROFILE
Drawing No:


DATUM LEVEL (m)
GROUND ELEVATION (m)
TOTAL DISTANCE (m)
PARTIAL DISTANCE (m)
RESIDUAL HEAD (m)
DISCHARGE (lps)
PIPE SIZE & TYPE (mm)
SOIL TYPE
Jmv4_DWL to Jmv4_62 – Kndege_Kongwa Rising Main
SPL(119.0)
Jmv4_TK to Jmv4_103 – Kndege_Kongwa Supply Main
4.12
DN110H(PE100_PN10)
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD,
P.O.BOX 826,
MOROGORO,
TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title: KONGWA (KIWANJA CHA NDEGE) PIEZOMETRIC PROFILE
Drawing No:

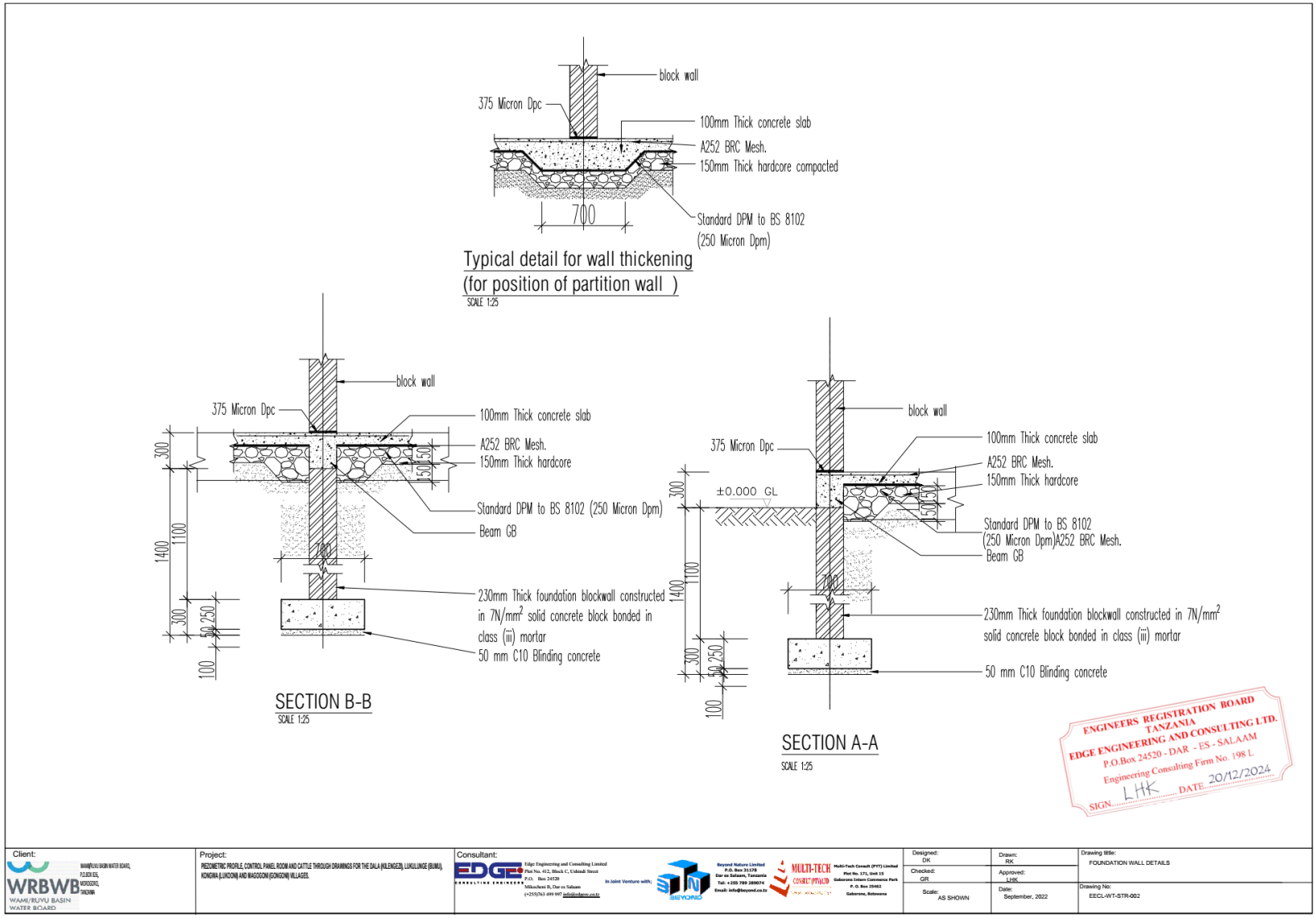

SPL(139.9)
140.0
130.0
120.0
110.0
100.0
90.0
Jmv5_DWL to Jmv5_16 – Lukooni_Kongwa Rising Main
Scale: [H 1:2500, V 1:500]
DN50H(PE100_PN16)
DN90H(PE100_PN10)
SPL(114.5)
120.0
110.0
100.0
90.0
DATUM LEVEL (m)
GROUND ELEVATION (m)
TOTAL DISTANCE (m)
PARTIAL DISTANCE (m)
RESIDUAL HEAD (m)
DISCHARGE (lps)
PIPE SIZE & TYPE (mm)
HDPE/GI – Kg/cm²
SOIL TYPE
4.12
DN110H(PE100_PN10)
Jmv5_TK to Jmv5_43 – Lukooni_Kongwa Supply Main
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title: KONGWA (LUKOONI) PIEZOMETRIC PROFILE
Drawing No:

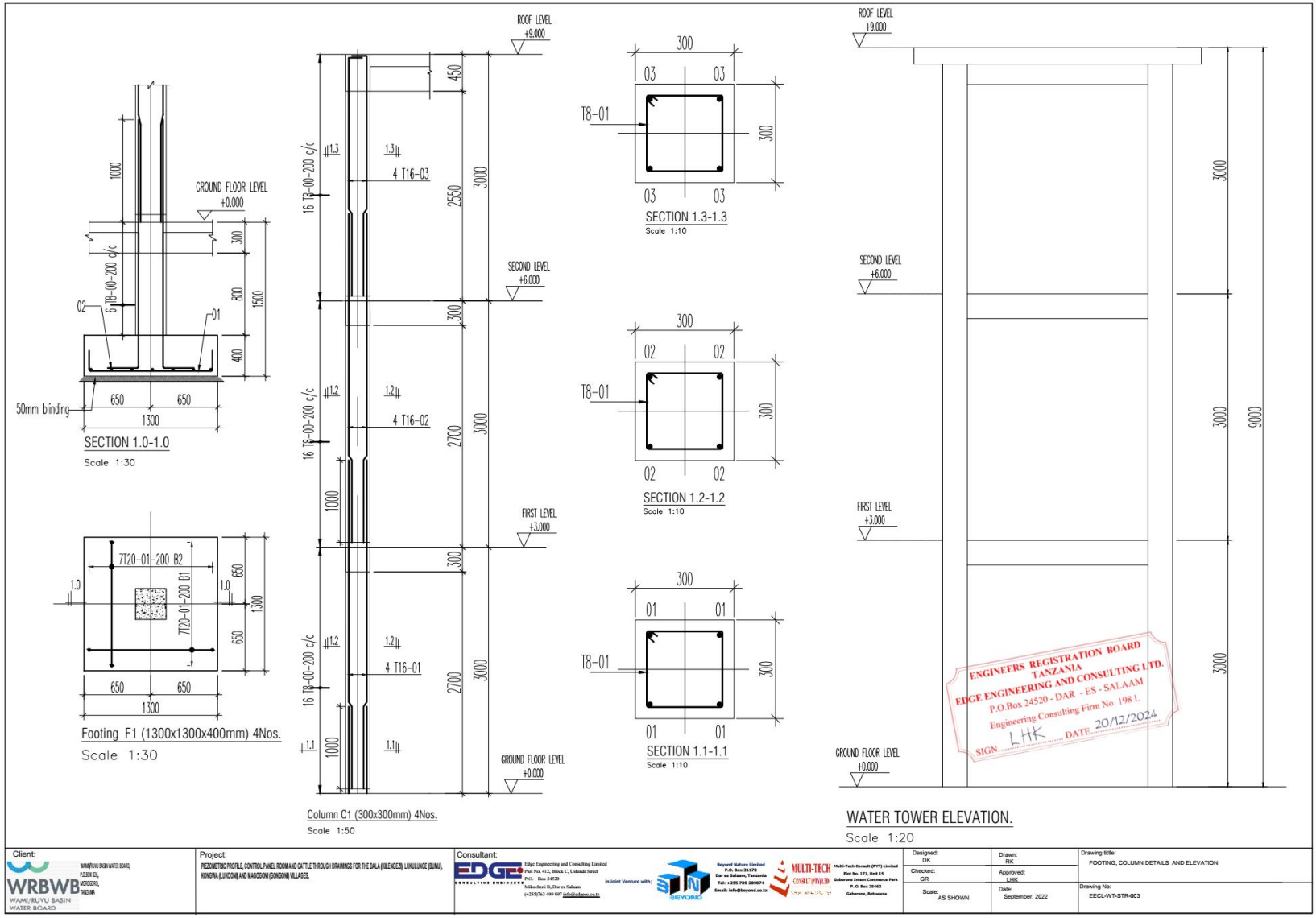


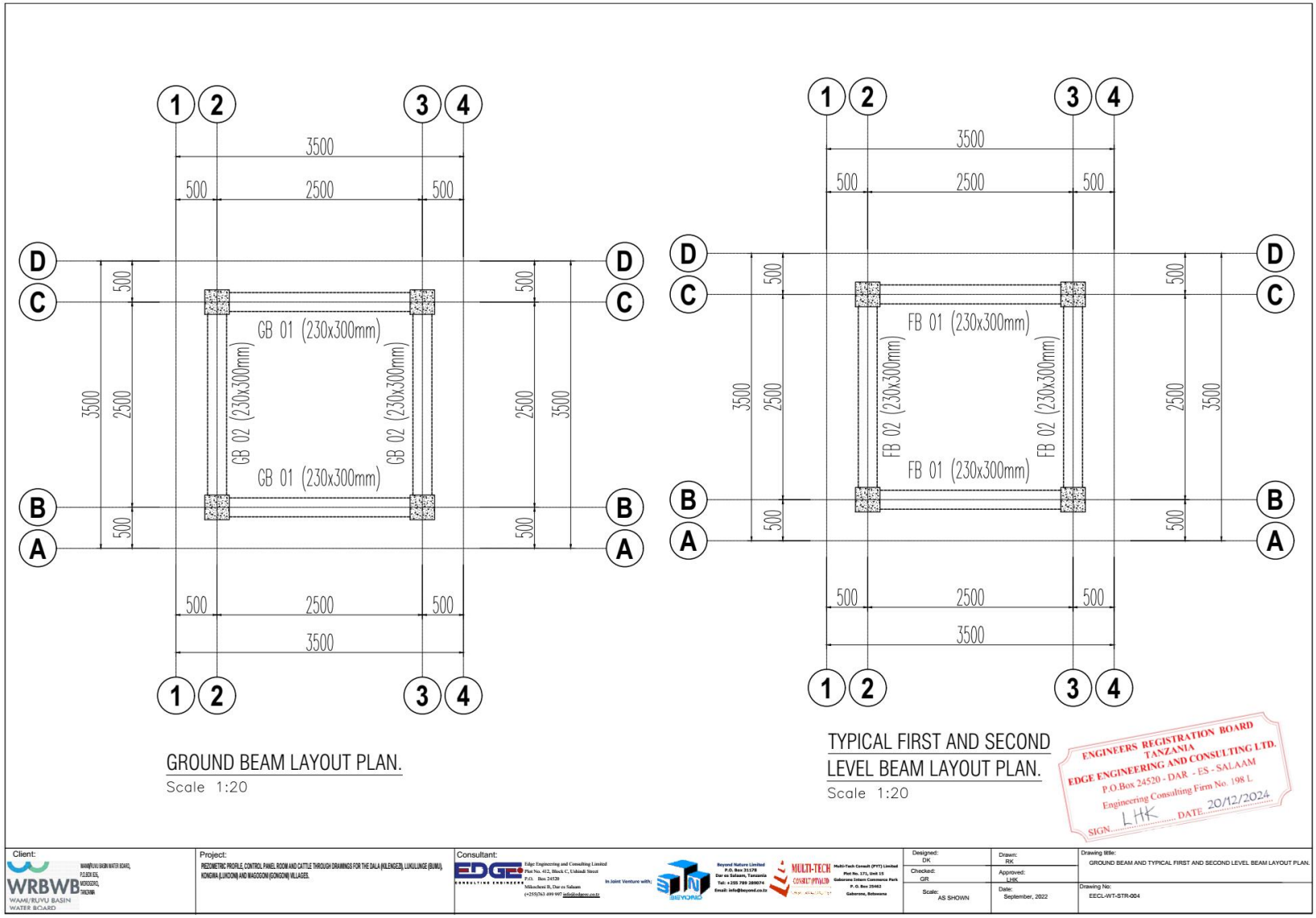
FOUNDATION LAYOUT PLAN.
Scale 1:20

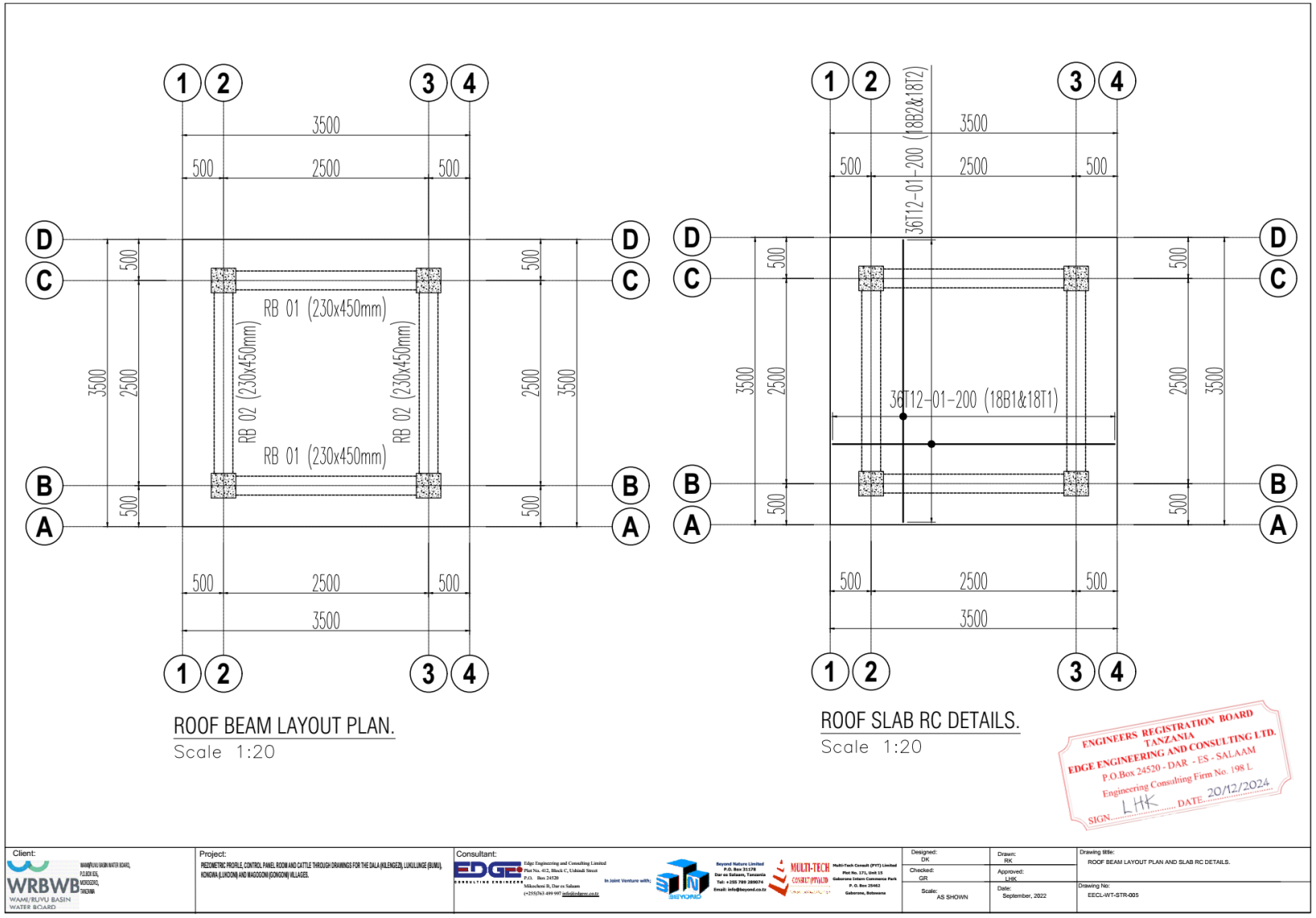
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024

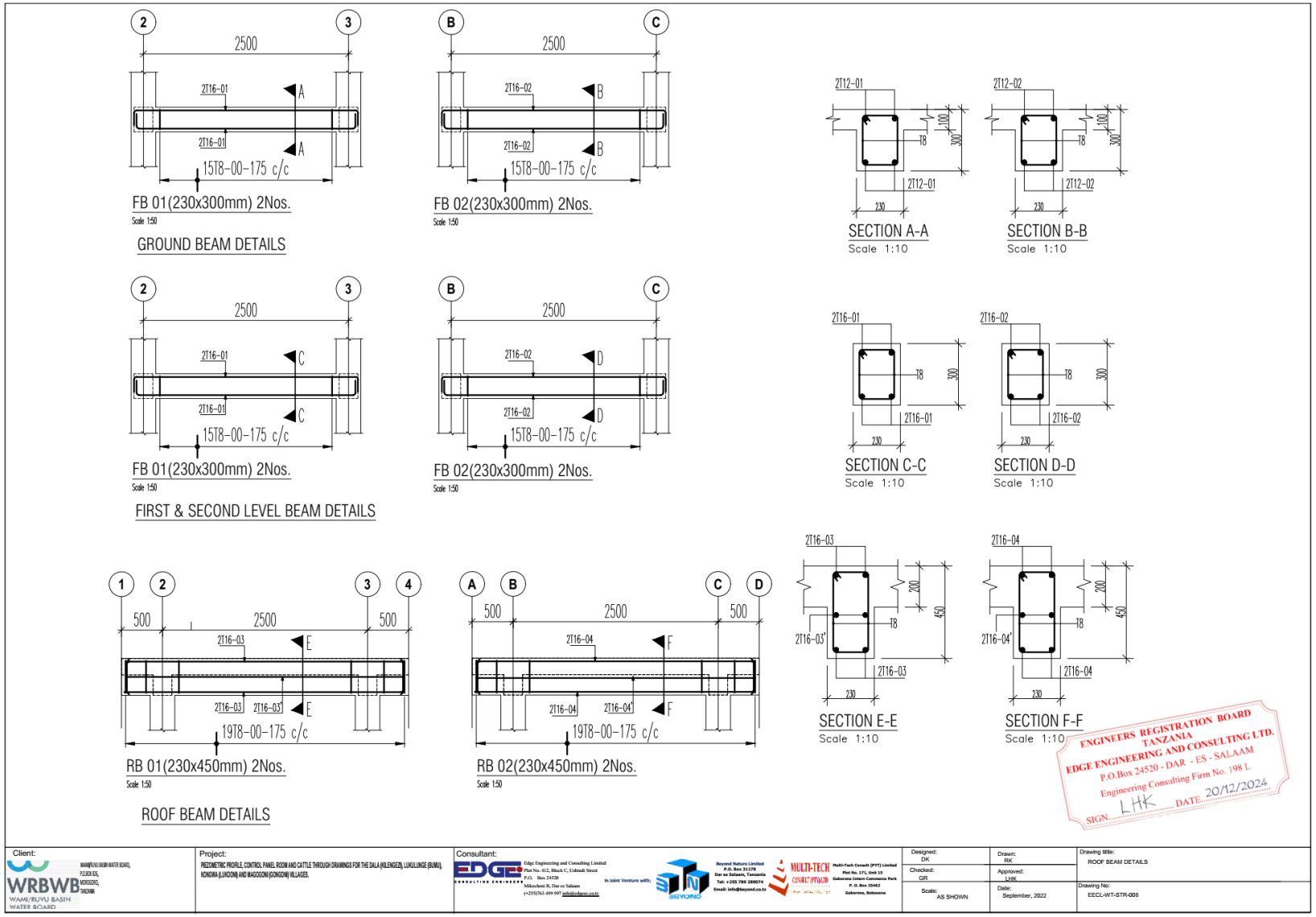
Client:	Project:	Consultant:	Designed: DK	Drawn: RK	Drawing title: FOUNDATION LAYOUT PLAN
WRBWB WAMI/RUVU BASIN WATER BOARD	PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEDI), LUKULINGE (BUMU), KONGWA (LUKOSHI) AND MAGOSONI (GONGONI) VILLAGES.	EDGE CONSULTING ENGINEERS; In Joint Venture with: BEYOND; MULTI-TECH CONSULT (PTY)LTD	Checked: GR	Approved: LHK	
			Scale: AS SHOWN	Date: September, 2022	Drawing No: EECL-WT-STR-001


block wall
375 Micron Dpc
100mm Thick concrete slab
A252 BRC Mesh.
150mm Thick hardcore compacted
700
Standard DPM to BS 8102
(250 Micron Dpm)
Typical detail for wall thickening
(for position of partition wall)
SCALE 1:25
block wall
375 Micron Dpc
100mm Thick concrete slab
A252 BRC Mesh.
150mm Thick hardcore
Standard DPM to BS 8102 (250 Micron Dpm)
Beam GB
230mm Thick foundation blockwall constructed in 7N/mm² solid concrete block bonded in class (iii) mortar
50 mm C10 Blinding concrete
300
1400
1100
150
150
300
50
250
100
700
SECTION B-B
SCALE 1:25
block wall
375 Micron Dpc
100mm Thick concrete slab
A252 BRC Mesh.
150mm Thick hardcore
±0.000 GL
Standard DPM to BS 8102
(250 Micron Dpm)A252 BRC Mesh.
Beam GB
230mm Thick foundation blockwall constructed in 7N/mm²
solid concrete block bonded in class (iii) mortar
50 mm C10 Blinding concrete
300
1400
1100
150
150
300
50
250
100
700
SECTION A-A
SCALE 1:25
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client:
WRBWB
WAMI/RUVU BASIN WATER BOARD
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULINGE (BUMU), KONGWA (LUKOMA) AND MAGOSONI (GONGONI) VILLAGES.
Consultant:
EDGE
Edge Engineering and Consulting Limited
Plot No. 412, Block C, Ushindi Street
P.O. Box 24520
Mikocheni B, Dar es Salaam
(+255)763 499 997
In Joint Venture with:
BEYOND
Beyond Nature Limited
P.O. Box 31578
Dar es Salaam, Tanzania
Tel: +255 789 289074
Email: info@beyond.co.tz
MULTI-TECH CONSULT (PTY)LTD
Multi-Tech Consult (PTY) Limited
Plot No. 171, Unit 15
Gaborone Intern Commerce Park
P. O. Box 25462
Gaborone, Botswana
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing title: FOUNDATION WALL DETAILS
Drawing No: EECL-WT-STR-002


ROOF LEVEL +9.000
GROUND FLOOR LEVEL +0.000
SECOND LEVEL +6.000
FIRST LEVEL +3.000
16 T8-00-200 c/c
4 T16-03
4 T16-02
4 T16-01
SECTION 1.0-1.0
Scale 1:30
50mm blinding
Footing F1 (1300x1300x400mm) 4Nos.
Scale 1:30
Column C1 (300x300mm) 4Nos.
Scale 1:50
SECTION 1.3-1.3
SECTION 1.2-1.2
SECTION 1.1-1.1
Scale 1:10
T8-01
WATER TOWER ELEVATION.
Scale 1:20
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE 20/12/2024
Client:
WRBWB
WAMI/RUVU BASIN WATER BOARD
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOSHI) AND MAGOSONI (GONGONI) VILLAGES.
Consultant:
EDGE
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: September, 2022
Drawing Title: FOOTING, COLUMN DETAILS AND ELEVATION
Drawing No: EECL-WT-STR-003


1 2 3 4
A B C D
3500
500
2500
GB 01 (230x300mm)
GB 02 (230x300mm)
FB 01 (230x300mm)
FB 02 (230x300mm)
GROUND BEAM LAYOUT PLAN.
Scale 1:20
TYPICAL FIRST AND SECOND LEVEL BEAM LAYOUT PLAN.
Scale 1:20
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client: WRBWB WAMI/RUVU BASIN WATER BOARD
Project: PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEDI), LUKULUNGE (BUMU), KONGWA (LUKOSHI) AND MAGOSONI (GONGONI) VILLAGES.
Consultant: EDGE Edge Engineering and Consulting Limited; In Joint Venture with: BEYOND Beyond Nature Limited; MULTI-TECH CONSULT (PTY)LTD Multi-Tech Consult (PTY) Limited
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing title: GROUND BEAM AND TYPICAL FIRST AND SECOND LEVEL BEAM LAYOUT PLAN.
Drawing No: EECL-WT-STR-004


1 2
3 4
3500
500
2500
500
D
C
B
A
RB 01 (230x450mm)
RB 02 (230x450mm)
RB 02 (230x450mm)
RB 01 (230x450mm)
36T12-01-200 (18B2&18T2)
36T12-01-200 (18B1&18T1)
ROOF BEAM LAYOUT PLAN.
Scale 1:20
ROOF SLAB RC DETAILS.
Scale 1:20
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client:
WRBWB
WAMI/RUVU BASIN WATER BOARD
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEDI), LUKULUNGE (BUMA), KONGWA (LUKOSHI) AND MAGOSONI (GONGONI) VILLAGES.
Consultant:
EDGE
In Joint Venture with:
BEYOND
MULTI-TECH
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing title: ROOF BEAM LAYOUT PLAN AND SLAB RC DETAILS.
Drawing No: EIECL-WT-STR-005


2
3
2500
2T16-01
A
15T8-00-175 c/c
FB 01(230x300mm) 2Nos.
Scale 1:50
B
C
2T16-02
B
FB 02(230x300mm) 2Nos.
GROUND BEAM DETAILS
2T12-01
2T12-02
T8
100
300
230
SECTION A-A
Scale 1:10
SECTION B-B
C
D
FIRST & SECOND LEVEL BEAM DETAILS
2T16-03
2T16-04
SECTION C-C
SECTION D-D
1
4
500
19T8-00-175 c/c
RB 01(230x450mm) 2Nos.
RB 02(230x450mm) 2Nos.
ROOF BEAM DETAILS
SECTION E-E
SECTION F-F
200
450
ENGINEERS REGISTRATION BOARD
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EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client:
WRBWB
WAMI/RUVU BASIN WATER BOARD
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGESI), LUKULUNGE (BUMU), KONGWA (LUKOSHI) AND MAGOSONI (GONGONI) VILLAGES.
Consultant:
EDGE
Designed: DK
Checked: GR
Scale: AS SHOWN
Drawn: RK
Approved: LHK
Date: September, 2022
Drawing title: ROOF BEAM DETAILS
Drawing No: EIECL-WT-STR-006

Village	Number of Cattle Trough
Dalla Kilengezi	2
Kongwa Lukooni	2
Dakawa (Sukuma Group)	1
Mbwade (Msufini)	3
Bwakila Chini (Migudeni)	4
Bwakila Chini (Umasaini)	4
Kongwa (K/Ndege)	4

Village	Number of Tanks
Dalla Kilengezi	1
Kongwa Lukooni	2
Dakawa (Sukuma Group)	1
Mbwade (Msufini)	3
Bwakila Chini (Migudeni)	3
Bwakila Chini (Umasaini)	3
Kongwa (K/Ndege)	2

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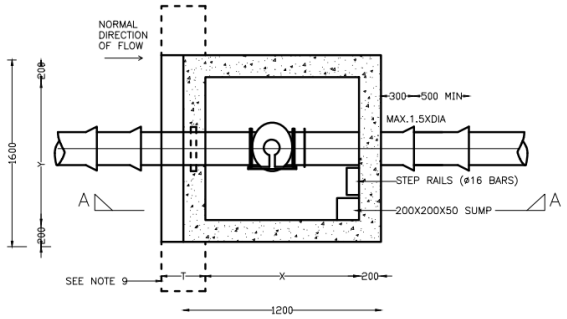
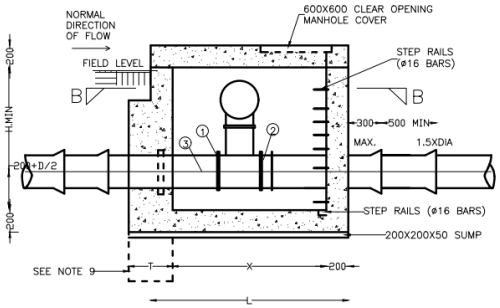
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024

Client: WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project: PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOONI) AND MAGOGONI (GONGONI) VILLAGES.
Consultant: Edge Engineering and Consulting Limited; In Joint Venture with: Beyond Nature Limited; Multi-Tech Consult (PTY) Limited
Designed: DK | Drawn: RK | Drawing title: NUMBER OF CATTLE TROUGH AND PLASTIC TANKS
Checked: GR | Approved: LHK
Scale: AS SHOWN | Date: September, 2022 | Drawing No:

VALVE CHAMBER TYPE I



SECTION B–B



SECTION A–A

① FLANGED GATE VALVE
② FLANGED ADAPTER
③ FLANGE/SPIGOT ANCHORING PUDDLE

DIMENSIONS FOR TYPE I

	DN	80	100	150	200	250	300	350	400	450	500
	X	800	800	800	900	1100	1100	1200	1200	1200	1300
	L	1200	1200	1200	1300	1500	1500	1600	1600	1600	1700
	Y	800	800	800	800	800	1000	1300	1400	1400	1400
	W	1200	1200	1200	1200	1200	1400	1700	1800	1800	1800
	H.MIN	840	850	875	900	950	1000	1670	1750	2100	2200
T	PN10	200	200	200	300	400	400	500	600	700	700
T	PN16	200	200	300	400	500	600	700	800	900	1000
T	PN25	200	300	400	500	700	800	900	1000	1200	1300

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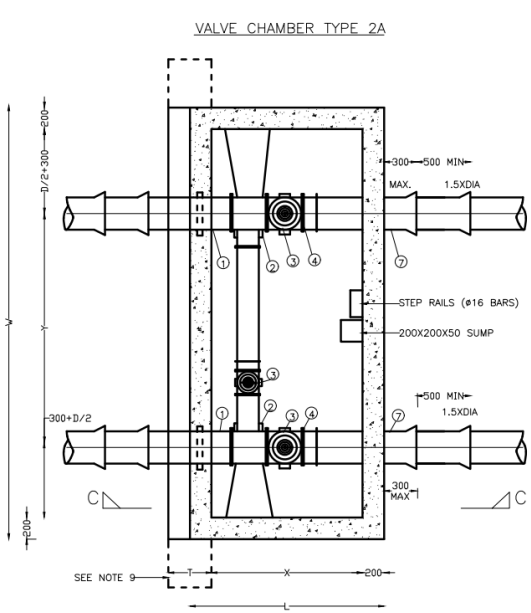
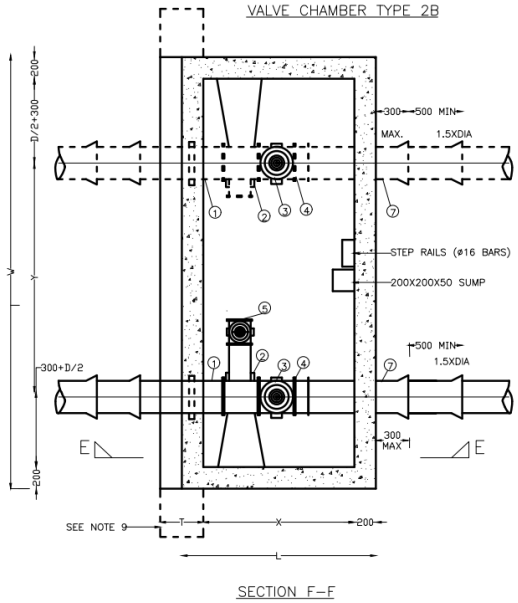
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024

Client: WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA	Project: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.	Consultant: EDGE Engineering and Consulting Limited; In Joint Venture with: Beyond Nature Limited; Multi-Tech Consult (PVT) Limited	Designed: DK; Checked: GR; Scale: AS SHOWN	Drawn: AM; Approved: LHK; Date: July, 2022	Drawing title: PLAN AND SECTION FOR STANDARD VALVE CHAMBERS; Drawing No:



SECTION D–D



SECTION F–F

NOTES

1. ALL DIMENSIONS ARE IN mm
2. BLINDING CONCRETE TO BE CLASS C10
3. TRUST BLOCKS AND CONCRETE STOOLS TO BE CLASS C20
4. ALL REINFORCED STRUCTURAL CONCRETE TO BE CLASS C25
5. PRE CAST CONCRETE CHAMBER ROOF SLABS TO HAVE A MAXIMUM MASS OF 1500Kg FOR EASY OF REMOVAL AND TO BE PROVIDED WITH SUITABLE LIFTING EYES
6. IF THE BRANCH LINE HAPPENS TO BE DN50, THE DIMENSION OF THE CHAMBER TO BE DETERMINED ON SITE
7. FORM WORK TO BE :
   –CLASS F1 FOR BURIED SURFACE
   –CLASS F2 FOR INTERNAL SURFACE
8. THE FLOOR SLAB TO HAVE A SLOPE OF 1% TO WARDS THE SUMP SO THAT ANY LEAKING WATER CAN DRAWN IN THE SUMP
9. PRE CAST ROOF SLABS TO HAVE 16 NoS
10. VALVE CHAMBER WALLS TO BE KEYED IN TO BASE AND SIDES OF TRENCH AS DIRECTED ON SITE BY THE ENGINEER

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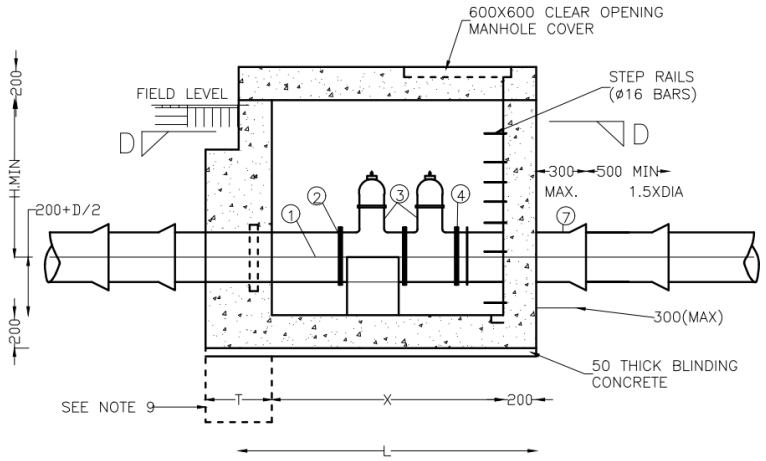
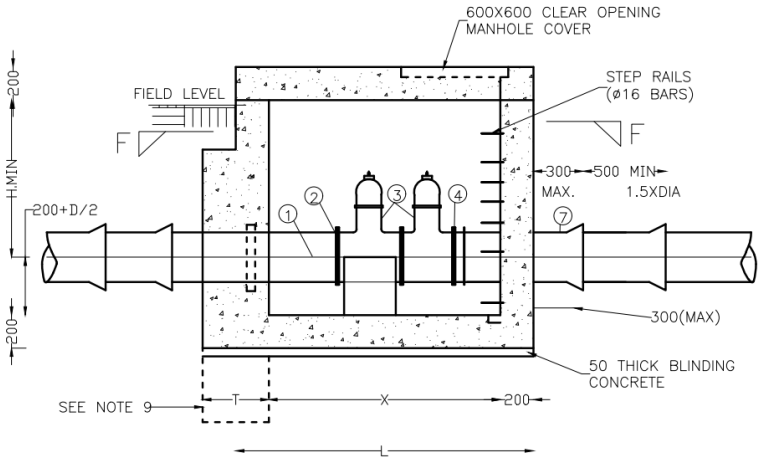
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. L HK DATE 20/12/2024

Client: WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA	Project: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.	Consultant: EDGE Edge Engineering and Consulting Limited, Plot No. 412, Block C, Ushindi Street, P.O. Box 24520, Mikocheni B, Dar es Salaam, (+255)763 499 997, info@edgeec.co.tz; In Joint Venture with: Beyond Nature Limited, P.O. Box 31178, Dar es Salaam, Tanzania, Tel: +255 789 289074, Email: info@beyond.co.tz; Multi-Tech Consult (PVT) Limited, Plot No. 171, Unit 15, Gaborone Intern Commerce Park, P. O. Box 25462, Gaborone, Botswana	Designed: DK; Checked: GR; Scale: AS SHOWN	Drawn: AM; Approved: LHK; Date: July, 2022	Drawing title: PLAN AND SECTION FOR STANDARD VALVE CHAMBERS; Drawing No:



SECTION C–C



SECTION E–E

DIMENSIONS FOR TYPE 2A &2B

	DN	200	250	300	350	400	450	500
	X	1400	1700	1900	2000	2000	2100	2200
	L	1800	2100	2300	2400	2400	2500	2600
	Y	1813	1804	1960	2075	2175	2265	2355
	W	3000	3050	3250	3400	3600	3700	3850
	H.MIN	900	925	950	975	1000	1025	1050
T	PN10	300	400	400	500	600	700	700
T	PN16	400	500	600	700	800	900	1000
T	PN25	500	700	800	900	1000	1200	1300

① FLANGED /SPIGOT ANCHORAGE PUDDLE
② ALL FLANGED TEE
③ FLANGE GATE VALVE
④ FLANGED ADAPTOR
⑤ BLANK FLANGE
⑥ FLANGE /SPIGOT PIECE
⑦ SPIGOT/SOCKET PIPE

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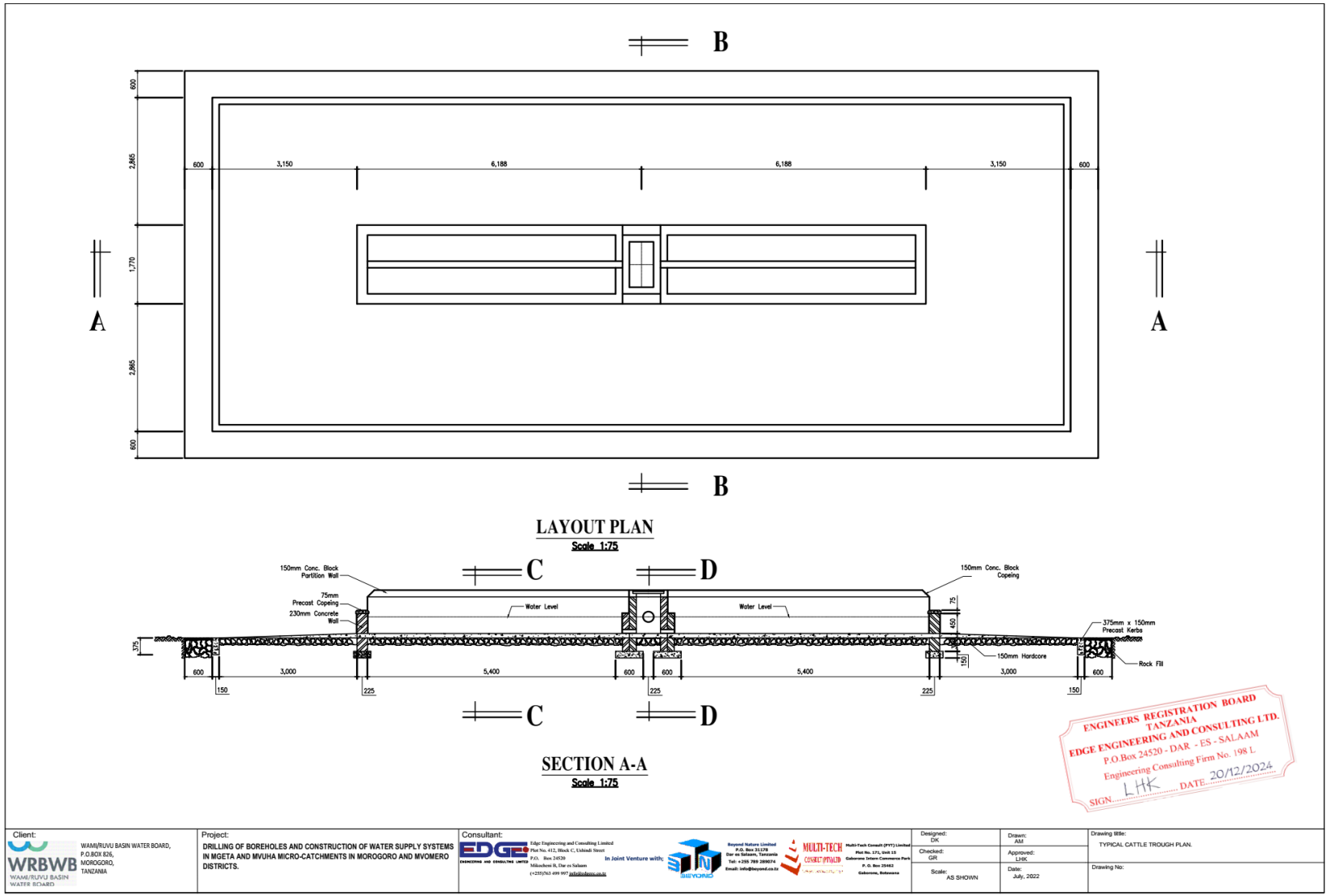
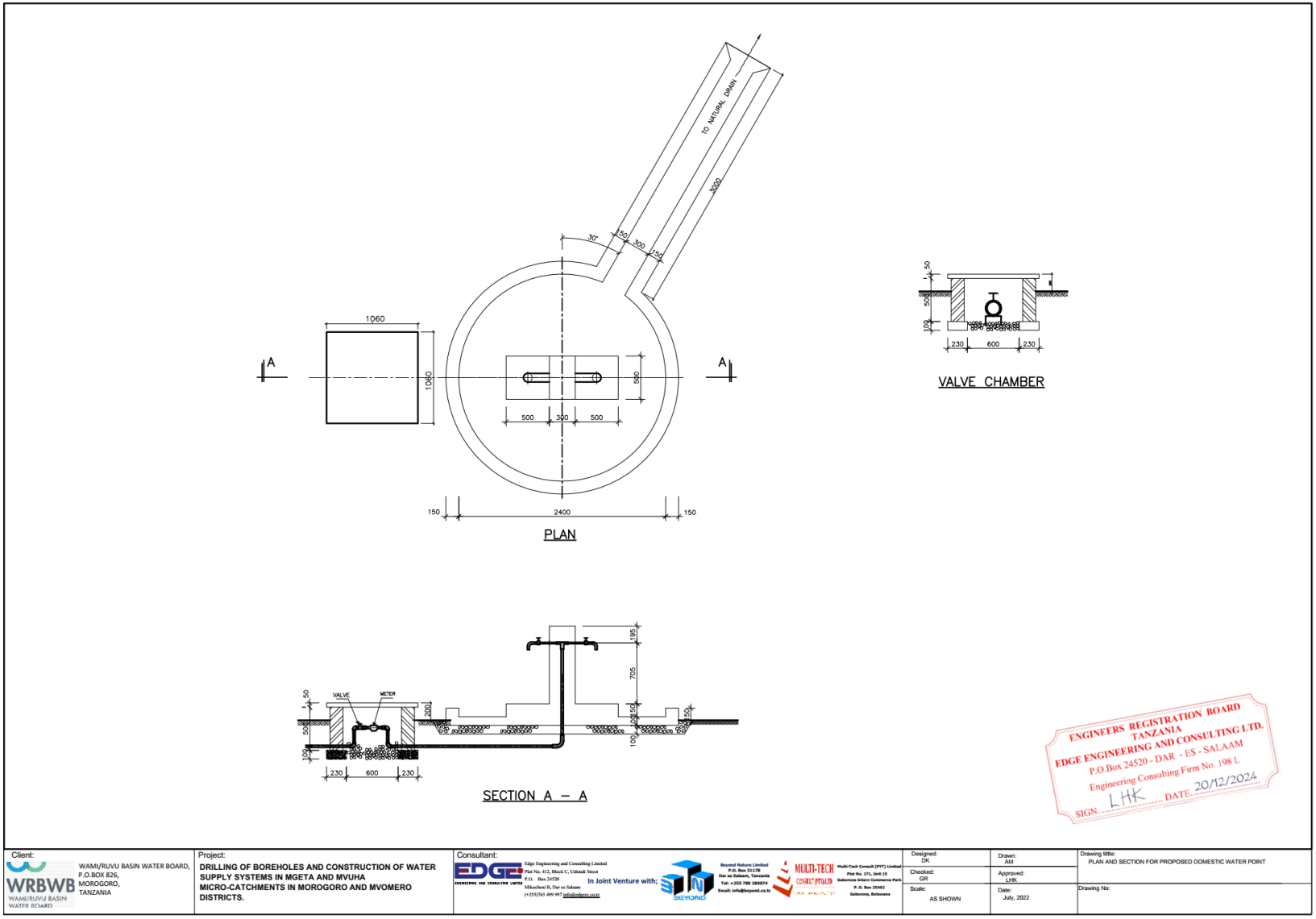
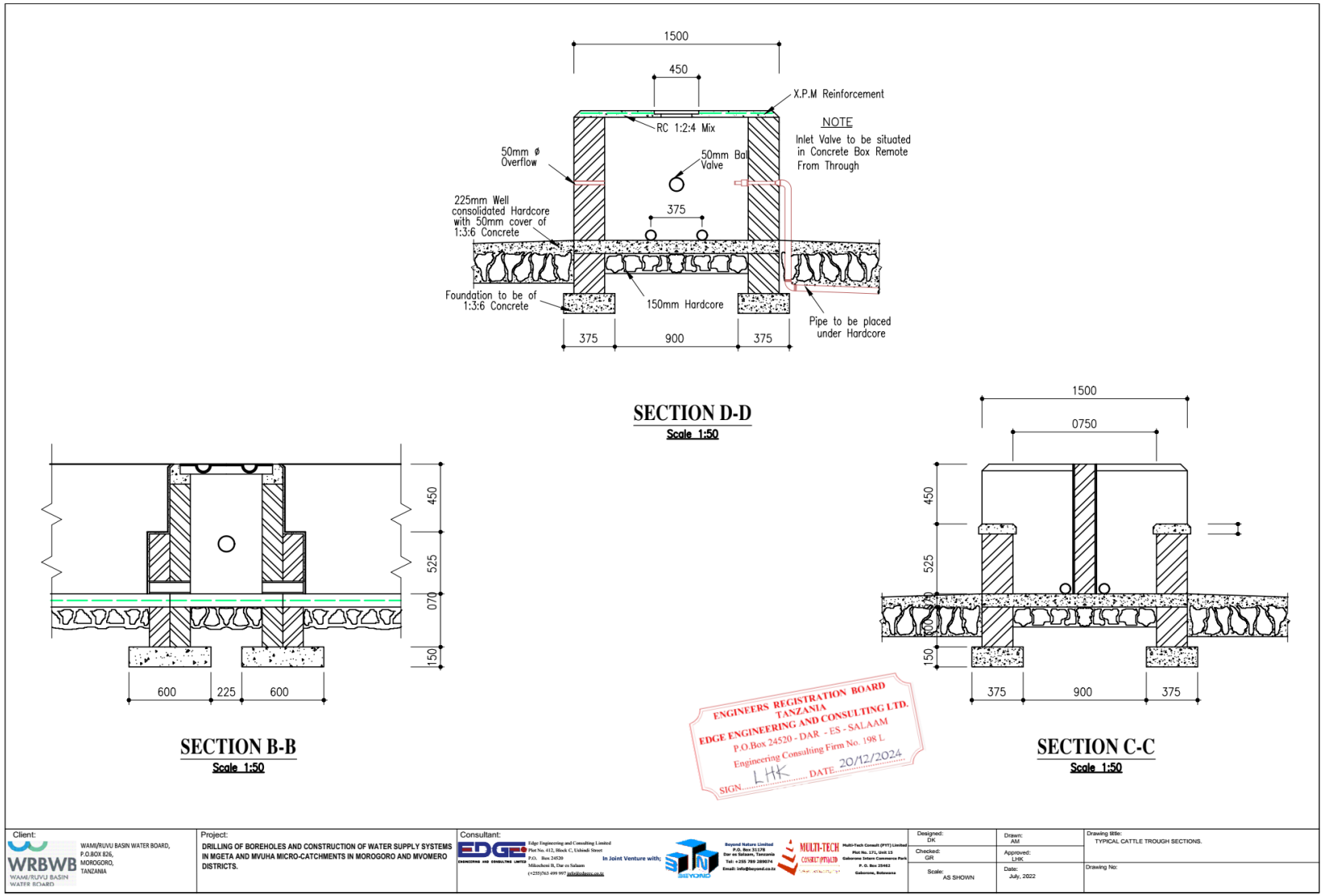
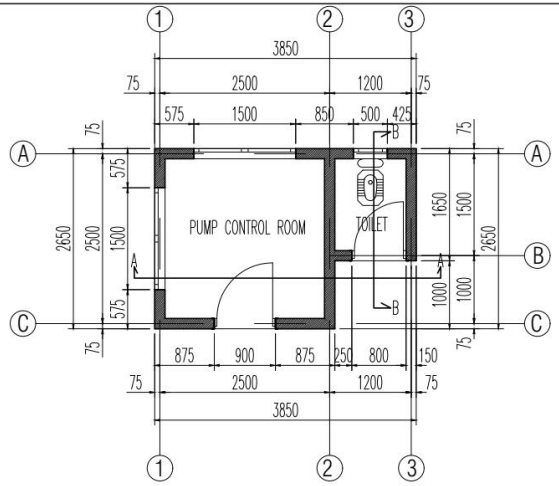
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024

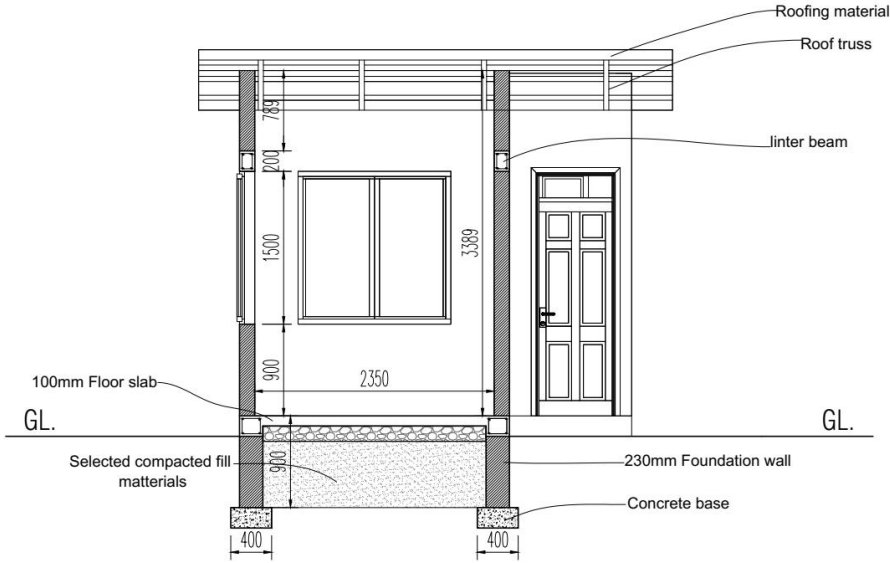
Client: WRBWB WAMI/RUVU BASIN WATER BOARD	Project: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.	Consultant: EDGE ENGINEERING AND CONSULTING LIMITED; In Joint Venture with: BEYOND; MULTI-TECH CONSULTANTS	Designed: DK; Checked: GR; Scale: AS SHOWN	Drawn: AM; Approved: LHK; Date: July, 2022	Drawing title: PLAN AND SECTION FOR STANDARD VALVE CHAMBERS; Drawing No:

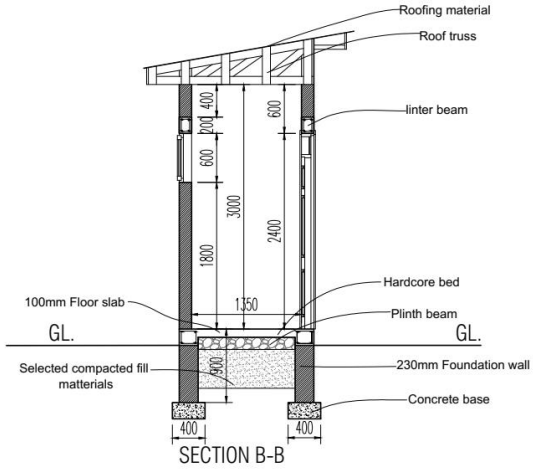

B
A
A
B
600
2,865
1,770
2,865
600
600
3,150
6,188
6,188
3,150
600
LAYOUT PLAN
Scale 1:75
C
D
150mm Conc. Block Partition Wall
75mm Precast Copeing
230mm Concrete Wall
Water Level
Water Level
150mm Conc. Block Copeing
375mm x 150mm Precast Kerbs
150mm Hardcore
Rock Fill
375
600
3,000
5,400
600
600
5,400
3,000
600
150
225
225
150
C
D
SECTION A-A
Scale 1:75
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client:
WRBWB
WAMI/RUVU BASIN WATER BOARD
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.
Consultant:
EDGE
In Joint Venture with:
BEYOND
MULTI-TECH CONSULT (PVT) LTD
Designed: DK
Drawn: AM
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title:
TYPICAL CATTLE TROUGH PLAN.
Drawing No:


TO NATURAL DRAIN
3000
30°
150
300
150
1060
1060
A
A
500
500
300
500
150
2400
150
PLAN
50
500
100
230
600
230
VALVE CHAMBER
195
705
50
100
150
VALVE
METER
50
500
100
200
230
600
230
SECTION A – A
ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE: 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD,
P.O.BOX 826,
MOROGORO,
TANZANIA
WRBWB
WAMI/RUVU BASIN WATER BOARD
Project:
DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.
Consultant:
EDGE
In Joint Venture with;
BEYOND
MULTI-TECH
Designed: DK
Drawn: AM
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title:
PLAN AND SECTION FOR PROPOSED DOMESTIC WATER POINT
Drawing No:


1500
450
X.P.M Reinforcement
RC 1:2:4 Mix
NOTE
Inlet Valve to be situated in Concrete Box Remote From Through
50mm ø Overflow
50mm Ball Valve
225mm Well consolidated Hardcore with 50mm cover of 1:3:6 Concrete
375
Foundation to be of 1:3:6 Concrete
150mm Hardcore
Pipe to be placed under Hardcore
375
900
375
SECTION D-D
Scale 1:50
450
525
070
150
600
225
600
SECTION B-B
Scale 1:50
1500
0750
450
525
150
375
900
375
SECTION C-C
Scale 1:50
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024
Client:
WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA
Project:
DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.
Consultant:
In Joint Venture with:
Designed: DK
Drawn: AM
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: July, 2022
Drawing title: TYPICAL CATTLE TROUGH SECTIONS.
Drawing No:







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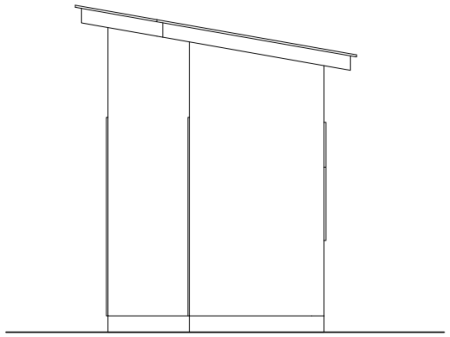
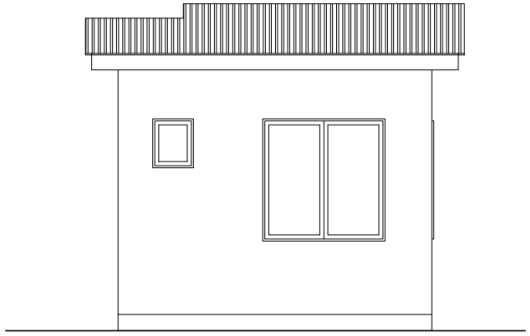
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024

Client:	Project:	Consultant:	Designed:	Drawn:	Drawing title:
WRBWB WAMI/RUVU BASIN WATER BOARD	DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.	EDGE Edge Engineering and Consulting Limited; In Joint Venture with: BEYOND; MULTI-TECH CONSULT (PTY) LTD	DK	AM	PUMP HOUSE PLAN AND SECTIONS
			Checked: GR	Approved: LHK	
			Scale: AS SHOWN	Date: July, 2022	Drawing No: WRWBD/E/PH/STD/01

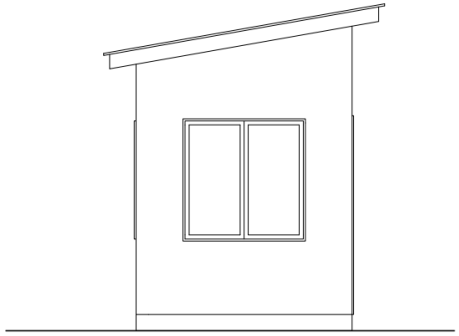
FRONT ELEVATION



RIGHT SIDE ELEVATION



REAR ELEVATION



LEFT SIDE ELEVATION

ENGINEERS REGISTRATION BOARD
TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN. LHK DATE. 20/12/2024

Client: WRBWB WAMI/RUVU BASIN WATER BOARD, P.O.BOX 826, MOROGORO, TANZANIA	Project: DRILLING OF BOREHOLES AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MGETA AND MVUHA MICRO-CATCHMENTS IN MOROGORO AND MVOMERO DISTRICTS.	Consultant: EDGE Edge Engineering and Consulting Limited, Plot No. 412, Block C, Ushindi Street, P.O. Box 24520, Mikocheni B, Dar es Salaam, (+255)763 499 997 info@edgeea.co.tz; In Joint Venture with; BEYOND Beyond Nature Limited, P.O. Box 31178, Dar es Salaam, Tanzania, Tel: +255 789 289074, Email: info@beyond.co.tz; MULTI-TECH CONSULT (PTY)LTD Multi-Tech Consult (PTY) Limited, Plot No. 171, Unit 15, Gaborone Intern Commerce Park, P. O. Box 20462, Gaborone, Botswana	Designed: DK; Checked: GR; Scale: AS SHOWN	Drawn: AM; Approved: LHK; Date: July, 2022	Drawing title: PUMP HOUSE ELEVATIONS. Drawing No: WRWBD/E/PH/STD/02


Well Vault
Top of Casing
Ground Surface
Note: Pump location is to be located after pumping test.
P – UPVC Plain
S – UPVC Screen
ENGINEERS REGISTRATION BOARD TANZANIA
EDGE ENGINEERING AND CONSULTING LTD.
P.O.Box 24520 - DAR - ES - SALAAM
Engineering Consulting Firm No. 198 L
SIGN LHK DATE 20/12/2024
Client:
WRBWB
WAMI/RUVU BASIN WATER BOARD
Project:
PIEZOMETRIC PROFILE, CONTROL PANEL ROOM AND CATTLE THROUGH DRAWINGS FOR THE DALA (KILENGEZI), LUKULUNGE (BUMU), KONGWA (LUKOMA) AND MAGOGONI (GONGONI) VILLAGES.
Consultant:
EDGE
In Joint Venture with:
BEYOND
MULTI-TECH CONSULTANTS
Designed: DK
Drawn: RK
Checked: GR
Approved: LHK
Scale: AS SHOWN
Date: September, 2022
Drawing title: BORE HOLE
Drawing No:

Appendix G: Water Sample Analytical Results

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF WATER

Telegram:" MTO"
Telephone: 255-023-2614748
Fax No. 255-023-2613519
Email: morolab@maji.go.tz

In reply quote Lab No. MGWQL54-2024/2025

Morogoro Water Laboratory
P.O. Box 826,
Maji Yard, Mazimbu Rd
Morogoro
Tanzania

01st November 2024.

GENERAL DESRCIPTION

Analysis requested by .... **DYNOTECH ENGINEERING LTD.....** Region.....**Morogoro...**
District...**Morogoro DC...** Ward....**Dala Kilengesi...**Village/street...**Dala.** Sampling Location. **BH...**
Sampling Date...**30.07.2024...** Received Date...**01.08.2024** Source of Water...**BH...** Depth.**140m.**
Type of water...**Natural Portable Water....** Purpose.... **Disinfection.....**
Sample collected by...**Laboratory Personnel....**
Coordinate. Latitude. **-7. 28697..,** Longitude.**37.85715...**

WATER SAMPLE ANALYTICAL RESULTS

1. Physical/chemical results

S/No.	Parameter	Units	Results	Tanzania Standards for Natural Portable Water (TZS 789:2018-EAS 12:2018)
1.	Temperature	^0C	29.63	nm
2.	Turbidity	NTU	4	25
3.	Color	TCU	8	50
4.	pH	-	7.69	5.5– 9.5
5.	Electrical Conductivity (E.C)	µS/cm	1109	2500
6.	Total Dissolved Solids (TDS)	mg/L	555	1500
7.	Phenol Alkalinity	mg/L	0.00	nm
8.	Total Alkalinity (TA)	mg/L as $CaCO_3$	387.3	nm
9.	Carbonates	mg/L	178	nm
10.	Non-Carbonates	mg/L	0.00	nm
11.	Total Hardness	mg/L as $CaCO_3$	178	600.00
12.	Calcium (Ca^{2+})	mg/L as $CaCO_3$	34.44	150
13.	Magnesium (Mg^{2+})	mg/L as $CaCO_3$	22.35	100
14.	Chloride (Cl^-)	mg/L	66.46	250
15.	Total Iron (Fe)	mg/L	0.00	0.3
16.	Manganese (Mn)	mg/L	0.00	0.1
17.	Nitrate (NO_3)	mg/L	0.003	45
18.	Nitrite Nitrogen (NO_2-N)	mg/L	0.00	0.9
19.	Sulphate (SO_4)	mg/L	74	400
20.	Phosphate (PO_4)	mg/L	0.00	2.2
21.	Fluoride (F)	mg/L	0.00	1.5
22.	Sodium (Na)	mg/L	41.1	200
23.	Potassium(K)	mg/L	8.41	50
24.	Free residue Chlorine	mg/L	0.00	0.2-0.5

nm - not mentioned

2.Heavy Metals Results

S/No.	Parameter	Units	Results	Tanzania Standards for Natural Portable Water (TZS 789:2018-EAS 12:2018)
25.	Arsenic (As)	mg/L	0.00	0.01
26.	Aluminium (Al)	mg/L	0.151	0.2
27.	Barium (Ba)	mg/L	0.0092	0.7
28.	Cadmium (Cd)	mg/L	0.00	0.03
29.	Total Chromium (as Cr)	mg/L	0.0004	0.05
30.	Copper (Cu)	mg/L	0.0088	1.000
31.	Cyanide (CN)	mg/L	0.00	0.01
32.	Lead (Pb)	mg/L	0.0004	0.01
33.	Selenium (Se)	mg/L	0.0003	0.01
34.	Zinc (Zn)	mg/L	**6.998**	5
35.	Boron	mg/L	0.0126	2.4

nm- not mentioned

3. Bacteriological results

S/No.	36.	37.	38.
Parameter	Total Coliform CFU/ 100mL (37°C)	Faecal Coliform CFU/ 100mL (44.5°C)	*E. coli* CFU/100mL (37°C)
Results	0	0	0
Comments	Excellent	Excellent	Excellent
Tanzania Standards for drinking water 789:2018-EAS 12:2018	Not detectable	Not detectable	Not detectable

Remarks
Water contain high concentration of Zinc.

Recommendation

- More pumping should be done for more than 24hrs and check if exceeded parameter are within a standard.
- We recommend Water quality monitoring should be done semiannually.

.....
Reporting Officer

01/11/2024
.....
Date

.....
Head of Water Laboratory

MOROGORO WATER QUALITY
LABORATORY.
MAJI YARD, MAZIMBU ROAD
P. O. BOX 826,
MOROGORO

Appendix H: Credentials of the Environmental Expert

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL

MAZINGIRA

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL

ENVIRONMENTAL EXPERTS' CERTIFICATE

(Issued under Regulations 19(2), 21(2) & 26 of the Environmental (Registration of Environmental Experts) Regulations, 2005)

*Certificate No. NEMC/EIA/....*0123*.....*

*Expert Registration No. NEMC/EIA.....*0179*.....*

This is to certify that

.....PETER H. LUENA.....*of*

.....P. O. BOX 71940 DAR ES SALAAM..... *has been registered as an Environmental Expert in accordance with the provisions of the Environmental Management Act Cap. 191 and is authorized to practise in the capacity of an Environmental Impact Assessment Expert in Tanzania*

*Dated this.....*10th*.....day of....*March*.....20*12*.....*

.....

Director General

UNITED REPUBLIC OF TANZANIA

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL

PRACTICING CERTIFICATE

(Issued under Regulations 27(1) and 30 of the Environmental Management (Registration and Practice of Environmental Experts) Regulations, 2021)

Expert Practicing Certificate No. **EC/P/EE-EIA/2023/93228**

This is to certify that

PETER HELPETER LUENA *of*
P.o. Box 71940, Dar Es Salaam

has been granted a Practicing Certificate to practice as an ***Environmental Expert*** *in category of* ***Category III - Consulting Environmental Experts*** *and shall provide expertise in the following field(s):*

Energy, Manufacturing, Tourism, Industry, Mining, Building & Construction, Telecommunication, Waste Treatment & Disposal, Transport And Infrastructure.

This Certificate shall be valid for period of three years from the date of issuance.

Issued this 28th day of Aug 2023

.....
The Registrar

Appendix I: Correspondences with the National Environment Management Council

THE UNITED REPUBLIC OF TANZANIA

VICE PRESIDENT OFFICE

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL
(NEMC)

In reply please quote:
Ref: CB. 145/208/480/2 **Date: 12th December, 2023**

Managing Director,
WAMI/RUVU BASIN WATER BOARD,
P.O Box 826,
DAR ES SALAAM.

Re: **PROPOSED BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS (WATER SECTOR SUPPORT PROJECT PHASE II) IN MVUHA MICRO-CATCHMENT AT DALLA, KONGWA, AND LUKURUNGE VILLAGES, AT MVUHA WARD IN MOROGORO DISTRICT COUNCIL, MOROGORO REGION.**

Reference is made to the above captioned subject.

2 The National Environment Management Council (NEMC) acknowledges receipt of your application attached with a project brief and filled Environmental Impact Assessment (EIA) registration forms for the above project. The project has been registered and assigned with **Application Reference Number (ARN) EC/EIA/2023/6872** for your future correspondence.

3. Following the review of the submitted documents, the Council has reached a decision that your project will end up at a Project Brief Stage. Thus, you are required to prepare an improved **Project brief report** which will guide the Council in decision making. However, from the submitted project brief report, the following information must be included to enhance information in the project brief report.

i. Ensure that report adheres to the format stipulated in Regulation 6 (1) Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018.
ii. Add the details of size of water storage tank facilities.
iii. Attach water quality report of the project area.
iv. Page 22, Environmental and Social Baseline, add the details of hydrogeological for the project site
v. Page 13, section 2.7 Project phases, add the detail of duration of every project phase.
vi. Page 1, section Policy, legal and Administrative Framework, show the relationship and how you will comply with all policer, act and legal regulation and listed in this project.
vii. Attach water use and water extract permit.
viii Attach lease agreement for the piece of land where project is going to be implemented in all sites.

Head Office, Kambarage Tower, 6th Floor, P.O Box 2724, Dodoma. Phone: +255 26 2960098, 0713 608930
Email Address: dg@nemc.or.tz Website: www.nemc.or.tz

ix. Add the list of signed names of all member attended the local consent for approval of this project including specific project site visited.

x. Page 13, section 2.7 adds the details of sanitary and security of this project during entire project life.

xi. Avoid typographical errors and repetitions of phrases.

4. Upon submission of the improved Project brief **(including one hardcopy)**, the Council will arrange for a technical review of the document. Review charges for the project is as per the Environmental Management (Fees and Charges) Regulations, 2021. A control number for payment will be generated automatically by the online-system once the improved **Project brief** is uploaded for review.

5. Looking forward to your continued cooperation.

E.S.Masisi
For: **Director General**

Cc: BEYOND NATURE LTD,
P.O. Box 31178,
Dar es Salaam, Tanzania.

Head Office, Kambarage Tower, 6th Floor, P.O Box 2724, Dodoma. Phone: +255 26 2960098, 0713 608930
Email Address: dg@nemc.or.tz Website: www.nemc.or.tz

THE UNITED REPUBLIC OF TANZANIA

VICE PRESIDENT'S OFFICE

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)

In reply please quote:
Ref: **CB.145/208/480**

21st October, 2024

Managing Director
Wami/Ruvu Basin Water Board
P.O. Box 826,
Morogoro

RE: REVIEW COMMENTS FROM CROSS-SECTORAL TECHNICAL ADVISORY COMMITTEE (TAC) MEETING FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR PROPOSED BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MVUHA MICRO-CATCHMENT AT DALLA, KONGWA, AND LUKURUNGE VILLAGES, MVUHA WARD IN MOROGORO DISTRICT, MOROGORO REGION.

Kindly refer to the above captioned subject.

2. The Council would like to inform you that a Technical Advisory Committee (TAC) review meeting was convened on 26th September,2024 and reviewed the Detailed Project Brief for the above-mentioned project;

3. Following the review process, the reviewers raised comments (see attachment) that need to be addressed in the comprehensive Improved Project Brief before re-submitting it to NEMC for further steps;

4. Furthermore, you are also required to address all comments as raised by the TAC review team; provide comments-response table indicating comments addressed section and page numbers where the comments have been addressed and where the comments have not been addressed indicate the reasons for not doing so and this should be appended in the final report;

5. We look forward for your continued corporation.

J.M. Baruti
For: Director General.

Cc: Ms. Beyond Nature Limited
P.O. Box 31178.
Dar es Salaam

COMMENTS TO IMPROVE THE DETAILED PROJECT BRIEF FOR PROPOSED BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MVUHA MICRO-CATCHMENT AT DALLA, KONGWA, AND LUKURUNGE VILLAGES, MVUHA WARD IN MOROGORO DISTRICT, MOROGORO REGION.

1.0 PROJECT PARTICULARS

Project title : Detailed Project Brief Report for Proposed Boreholes Drilling and Construction of Water Supply Systems in Mvuha Micro-Catchment at Dalla, Kongwa, And Lukurunge Villages, Mvuha Ward in Morogoro District, Morogoro Region.

Location : Morogoro District, Morogoro Region.
Developer : Wami/Ruvu Basin Water Board.
Consultant : Ms. Beyond Nature Limited

2.0 GENERAL COMMENTS

1.1 Page i: ensure that all experts with outstanding debts with the Council clear their debts before further steps. This includes Peter Luena and Stella Mwampobe Senkoro who has outstanding in EIA and EA. Refer to the Council's public notice published in the Council website which prohibits experts with outstanding debts from practicing

- Ensure that an expert in water resources is included in the team

1.2 Cover page: ensure that the Firm of Environmental Experts has practicing certificate

1.3 Ensure that adequate information is provide in the Environmental Management Plan and Environmental Monitoring Plan which have not been exhausted.

1.4 Provide all relevant documents including proof of land ownership, technical studies and drawings.

1.5 To prevent any potential conflict of interest, the responsibility for water testing should be separated from the WRBWB.

2. SPECIFIC COMMENTS

2.1.1 Page 7, s. 2.2.2 and 2.2.3: provide information for each location instead of generalizing. All projects are accessible through TANZAM highway but on different sides and distance.

2.1.2 Page 11, s. 2.5: provide the land size for each component and transmission, and distribution

2.1.3 Page 17m s. 2.8.4: provide proof/agreement with RUWASA regarding operating the project.

2.1.4 Chapter 3: Ensure that laws are cited in hierarchy, start with the Principal Legislations, followed by the Subsidiary Legislations, for example cite the Environmental Management Act, Cap 191 and all other Principal Legislations, refers to the Subsidiary Legislation made under the auspices of the Principle Legislation,

2.1.5 Page 32, s. 3.4.17: replace the Employment and Labour Relations Act 2004 with has been repealed and replaced by the Employment and Labour Relations Act [Cap. 366 RE. 2019], Also ensure that you state the relevance of the law to your project as well as how you will abide by the requirements of the law,

2.1.6 Page 29, s. 3.4.8 and 3.4.9: provide current versions of the Land Act, No. 4 of 1999 and the Village Land Act, 1999 which were revised in 2019 to read as the Land Act, [Cap. 113 RE:2019] and The Village Land Act, [Cap 114 RE.2019].

2.1.7 Page 36, s. 3.4.25: provide proper citation for the Fees and Charges Regulations as the Environmental Management (Fees and Charges) (Amendment) Regulations, 2024 read as one with the Environmental Management (Fees and Charges) Regulations, 2021

2.1.8 Chapter 3: incorporate the following;

(i) The Company Act, [Cap. 212 RE.2019],

(ii) The National Social Security Fund Act, [Cap. 50, RE.2018],

(iii) The Local Government (District Authorities) Act, Cap. 287 is not cited and referred, cite specific provisions of the law and concisely describe on how you will comply with the requirements of the law,

(iv) The Environmental Management (Environmental Impact Assessment and Audit) Regulations, 2005 as amended by G.N. No. 474 of 2018.

2.1.9 Page 45, s. 4.3.1: provide sources of data and ensure that the information is from a reputable source

2.1.10 Chapter 4: provide demographic data including age-sex ratio and age - sex distribution

2.1.11 Page 46, s. 4.3.5: provide adequate hydrological data relevant to the project including aquifer properties, water quality and general assessment of groundwater availability

2.1.12 Provide chapter for cost benefit analysis that has quantified variables for the proposed project indicating the following:

a. The decision problems for the proposed project;
b. Quantity of the benefits of the project;
c. Monetary values to each benefit;
d. Quantity of the costs of the intervention;
e. Life span for the cost and benefit;
f. Comparison for the estimated costs with the benefit; and
g. The uncertainty analysis to assess the robustness of the study results for the proposed project

2.2 Page 62, s. 6.4: include impacts on land take considering that the projects will be located on land used for pastoralism which can lead to reduced grazing area and add to conflicts if the grazing area is inadequate.

2.3 Page 66, s. 6.4.4.1.3. ensure description contents for Workers Accidents and Hazards during Demolition is relevant to project type;

2.4 Chapter 6: ensure that negative impacts during operation phase include the impacts to the community in case of pollution of water borehole;

2.5 Table 15 and 16: ensure the following:

i. Incorporate requirement of tanks cleanness, control of sludge and sustainability of the water sources during operations phase
ii. Include water quality and required parameters, and frequency of monitor for the safety of users;
iii. Targets and parameters are quantifiable instead of using terms phrases like no significant loss, no pollution, minimum as possible
iv. Add impacts and their monitoring. It is not realistic to provide only two impacts for a project that will operate for about 20 years. For instance, generation of waste water due to presence of toilet, depletion of ground water, spread of diseases, land conflict,

2.6 Appendix E: provide approved site layout plan and other drawings

2.7 Provide the following:

i. Proof of land acquisition/land ownership
ii. Results of water tests for each borehole
iii. Results of hydrogeological study

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF WATER
WAMI/RUVU BASIN WATER BOARD
P. O. BOX 826
MOROGORO
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WRBWB
WAMI/RUVU BASIN
WATER BOARD

Tel: + 255 23 2614748, + 255 23 2613519, Fax: + 255 23 2613519
P.O.Box 9091 Maji Ubungo, Dar es Salaam Tanzania | P.O. Box 412 Yadi ya Maji, Dodoma, Tanzania

Ref. No. WRB/HYDRO/320 **Date: 16th December, 2024**

The Director General,
National Environmental Management Council (NEMC),
P. O. Box 63154,
Dar es Salaam., Tanzania.

RE: PROPOSED BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS (WATER SECTOR SUPPORT PROJECT PHASE II) IN MVUHA MICRO-CATCHMENT AT DALLA, KONGWA AND LUKULUNGE VILLAGES AT MVUHA WARD IN MOROGORO DISTRICT COUNCIL, MOROGORO REGION.

Reference is made to the above caption.

2. The proposed project was registered with NEMC with registration number EC/EIA/2023/6872. After screening, it was decided that the project will end up in Project Brief Stage. The basin was instructed to prepare Comprehensive Project Brief which will guide NEMC in decision making.

3. However, the government has decided to postpone implementation of the project in Kongwa na Lukulunge villages due to budget constrain. We are requesting your good office to withdraw the mention villages in EIA process.

4. Thanking you for continued cooperation

Paskalia Bazil
For: BASIN DIRECTOR

Appendix J: Comments Response Table

COMMENTS RESPONSE TABLE TO IMPROVE THE DETAILED PROJECT BRIEF FOR PROPOSED BOREHOLES DRILLING AND CONSTRUCTION OF WATER SUPPLY SYSTEMS IN MVUHA MICRO-CATCHMENT AT DALLA VILLAGE, MVUHA WARD IN MOROGORO DISTRICT, MOROGORO REGION

1.0 PROJECT PARTICULARS

Project title: Proposed boreholes drilling and construction of water supply systems in Mvuha micro-catchment at Dalla, Kongwa and Lukurunge Villages, Mvuha Ward in Morogoro District, Morogoro region.

Location: Morogoro District, Morogoro region

Developer: Wami/Ruvu Basin Water Board

Consultant: Ms. Beyond Nature Limited

No.	Comments	Addressed	Not addressed	Reason (for comment not addressed)	Section	Page no.
2.0 GENERAL COMMENTS						
1. GENERAL COMMENTS						
1.1	Page i: ensure that experts with outstanding debts with the Council clear their debts before further steps. This includes Peter Luena and Stella Mbwambo Senkoro who has outstanding in EIA And EA. Refer to the Council's public notice published in the Council website which prohibits experts with outstanding debts from practicing • Ensure that an expert in water resources is included in the team	Yes			Payment of debts has been done.	
1.2	Cover page: ensure that the Firm of Environmental Experts has practicing certificate	Yes			Appendix H	141 - 142

No.	Comments	Addressed	Not addressed	Reason (for comment not addressed)	Section	Page no.
1.3	Ensure that adequate information is provided in the Environmental Management Plan and Environmental Monitoring Plan which have not been exhausted	Yes			Table 15 Table 16	72 – 75 77 - 78
1.4	Provide all relevant documents including proof of land ownership, technical studies and drawings	Yes			Appendix E Appendix F	102 – 109 110 - 138
1.5	To prevent any potential conflict of interest, the responsibility of water testing should be separated from WRBWB	Yes			Appendix G	139 - 140
2. SPECIFIC COMMENTS						
2.1.1	Page 7, s. 2.2.2 and 2.2.3: provide information for each location instead of generalizing. All project are accessible through TANZAM Highway but on different sides and distances.	Yes			2.2.2 2.2.3	7 7
2.1.2	Page 11, s. 2.5; provide the land size for each component and transmission and distribution	Yes			2.5.6 Table 3	9 9
2.1.3	Page 17, s. 2.8.4: provide proof/agreement with RUWASA regarding operating the project		Yes	No Written document but this is according to the law.		
2.1.4	Chapter 3: Ensure that laws are cited in hierarchy, start with the Principal Legislations, followed by Subsidiary Legislations, for example cite the Environmental Management Act, Cap 191 and all other Principal Legislations, refers to the Subsidiary Legislation made under the auspices of the Principal Legislation,	Yes			Chapter 3	17 - 41
2.1.5	Page 32, s. 3.4.17: replace the Employment and Labour Relations Act 2004 which has been repealed and replaced by the Employment and Labour Relations Act [Cap 366 RE 2019]. Also ensure that you state the relevance of the law to your project as well as how you will abide by the requirements of the law.	Yes			3.3.17	28

No.	Comments	Addressed	Not addressed	Reason (for comment not addressed)	Section	Page no.
2.1.6	Page 29, s. 3.4.8 and 3.4.9: provide current versions of the Land Act, No. 4 of 1999 and the Village Land Act, 1999 which were revised in 2019 to read as the Land Act [Cap 113 Re:2019 and The Village Land Act [Cap 114 RE.2019]	Yes			3.3.8 3.3.9	25 25
2.1.7	Page 36, s. 3.4.25: provide citation for the Fees and Charges Regulations as the Environmental Management (Fees and Charges) (Amendments) Regulations, 2024 read as one with the Environmental Management (Fees and Charges) Regulations, 2021				3.4.4	32
2.1.8	Chapter 3: incorporate the following; i. The Company Act, [Cap 212 RE.2019]	Yes			3.3.23	30
	ii. The National Social Security Fund Act, [Cap 50 RE.2018]	Yes			3.3.24	31
	iii. The Local Government (District Authorities) Act, Cap 287 is not cited and referred, cite specific provisions of the law and concisely describe on how you will comply with the requirements of the law,	Yes			3.3.25	31
	iv. The Environmental Management (Environmental Impact Assessment and Audit) Regulations, 2005 as amended by G.N. No. 474 of 2018	Yes			3.4.1	31
2.1.9	Page 45, s. 4.3.1: provide sources of data and ensure that the information is from reputable source	Yes			4.3.1	42
2.1.10	Chapter 4: provide demographic data including age-sex ratio and age-sex distribution.	Yes			4.4.2 Table 6	45 46 - 47
2.1.11	Page 46, s. 4.3.5:provide adequate hydrological data relevant to the project including aquifer properties, water quality and general assessment of groundwater availability.	Yes			4.3.5	43 - 45
2.1.12	Provide chapter for cost benefit analysis that has quantified variable for the proposed project indicating the following: a. The decision problems of the proposed project;	Yes			10.1	79

No.	Comments	Addressed	Not addressed	Reason (for comment not addressed)	Section	Page no.
	b. Quantity of the benefits of the project	Yes			10.2	79
	c. Monetary values of each benefit		Yes	Not calculated		
	d. Quantity of the costs of the intervention;	Yes			10.3.1	80
	e. Life span for the cost and benefit;	Yes			10.2.3	80
	f. Comparison of the estimated costs with the benefits; and	Yes			10.2.1	79
	g. The uncertainty analysis to assess the robustness of the study results for the proposed project	Yes			10.2.2	80
2.2	Page 62, s. 6.4: include impacts on land take considering that the projects will be located on land used for pastoralism which can lead to reduced grazing area and add to conflicts if the grazing area is inadequate.	Yes			6.4.3.2.4	64
2.3	Page 66, s. 6.4.4.1.3. ensure description contents for workers Accidents and hazards during demolition is relevant to project type;	Yes			6.4.4.1.3	65
2.4	Chapter 6: ensure that negative impacts during operation phase include the impacts to the community in case of pollution of water borehole;	Yes			6.4.3.2.3	64
2.5	Table 15 and 16: ensure the following: i. Incorporate requirement of tanks cleanness, control of sludge and sustainability of the water sources during operation phase	Yes			Table 15 Table 16	72 – 75 77 - 78
	ii. Include water quality and required parameters and frequency of monitor of the safety of users;	Yes			Table 15 Table 16	72 – 75 77 - 78
	iii. Targets and parameters are quantifiable instead of using terms phrases like no significant loss, no pollution, minimum as possible	Yes			Table 15 Table 16	72 – 75 77 - 78

No.	Comments	Addressed	Not addressed	Reason (for comment not addressed)	Section	Page no.
	iv. Add impacts and their monitoring.it is not realistic to provide only two impacts for a project that will operate for about 20 years. For instance, generation of wastewater due to presence of toilet, depletion of ground water, spread of disease, land conflict	Yes			6.4.3.2.4	64
2.6	Appendix E: provide approved site layout plan and other drawings	Yes			Appendix F	110 - 138
2.7	Provide the following: i. Proof of land acquisition/land ownership	Yes			Appendix E	102 - 109
	ii. Results of water tests for each borehole	Yes			Appendix G	139 - 140
	iii. Results of hydrogeological study	Yes			4.3.5	43 - 45