GASCO

ANNUAL ENVIRONMENTAL AUDITING REPORT - SEPTEMBER 2023

EIA CERTIFICATE NO.EC/EIS/598

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1.0 EXECUTIVE SUMMARY

Introduction

This is an Environmental Audit for National Natural Gas Infrastructures (NNGI), which is operated by GAS COMPANY TANZANIA LIMITED a subsidiary company of Tanzania Petroleum Development Corporation (TPDC). The company has four operational areas which are Kinyerezi gas receiving station Dar es salaam, Madimba gas processing plant Mtwara, Songosongo gas processing plant and Somangafungu gas station both located in Lindi region.

Scope and purpose of the environmental audit

The purpose of this study was to adhere to the requirement of the Environmental Impact Assessment and Audit Regulations, 2005 (G.N No. 349 of 2005) and the Environmental Management Act, Cap 191 of 2004 (EMA). Section 50 (1) of the Environmental Impact Assessment and Audit Regulations, 2005 requires that in executing project or development, after the environmental impact statement has been approved by the Minister, or after the initial audit of an ongoing project, the proponent or the developer shall take all practical measures to ensure the implementation of the environmental management plan by;

i. Carrying out annual auditing;
ii. Preparing an environmental audit report after each audit and submitting the report to the National Environment Management Council annually or as may be prescribed by the Council.

Brief description of the project

GASCO is a government owned company based in Dar es salaam, registered with business license number 20000012892 its head office is located plot no. 1 Block D, Kibaga street Kinyerezi Dar es Salaam Region. The company started its operation in 1st September 2014. The main raw material is unprocessed natural gas from up-streamers. The NNGI consists of 551 km of pipeline network from Msimbati via madimba (Mtwara), songosongo (Lindi) and Dar es salaam. The Pipeline design capacity is 784 mmscfd, on other hand Madimba and Songosongo plants have the capacity of 210 and 140 mmscfd respectively. There are three processes/units involved during natural gas processing,

which are Reception facility, Dehydration and de-hydrocarbon unit and Gas Export unit. While filtration and metering are the main stages during gas transportation.
In Tanzania, all projects, undertakings and activities that may potentially have adverse impacts on the surrounding environment are regulated by the Environmental Impact Assessment and Audit Regulations of 2005, which were made under sections 82 (1) and 230(2)(h) and (q) of the Environmental Management Act, 2004 (Act No. 20 of 2004).

According to the Environmental Impact Assessment and Audit Regulations, 2005 (G.N NO. 349 of 2005) and the Environmental Management Act, Cap 191 of 2004 (EMA), this project falls under the EIA mandatory list of projects which a full EIA is required. The ESIA for this project was conducted in 2011 by Ardhi University Environmental department under registration number EC/EIS/598 issued on 10th May 2012 (**See Appendix 1**).

GASCO using his internal capacity decided to carry out this annual Environmental. The main aim of this assignment is to undertake the environmental audit of the facility and update the existing Environmental and Social Management Plan (ESMP) in order to meet the requirement of the Environment Impact Assessment and Audit Regulations, (GN No. 349/2005).

Methodology

The methodology used in this study included review of literature, historical performance, collection of performance data and actual site inspection/visit. Environmental impacts were analyzed using simple matrix methodology and expert judgement.
The policies which are relevant to the company operations include: National Environmental Policy (URT, 1997), National Land Policy (URT, 1996), Sustainable Industrial Development Policy (SIDP 1996-2020), National Water Policy (URT, 2002), Energy Policy of Tanzania (URT, 2003), National Health Policy (URT, 2003), National Investment Promotion Policy (URT 1996), National Employment Policy (URT,1997), National Policy on HIV/AIDS, (URT, 2001), the National Strategy for Growth and Reduction of Poverty (NSGRP), and Tanzania Development Vision 2025.

The objectives of this EA are to assess the efficacy of mitigation measures included in the environmental management plan, Identify and assess environmental problems associated with the facility, identify environmental impacts of the existing and planned operations, propose mitigation measures where applicable and lastly to provide an indication of the measures taken.

The following were observed during audit,

- Gas Company (T) Limited has a written HSE policy which saves as environmental management tools
- Allocate specific budget annually to manage and implement all safety and environmental matters, include budget for annual environmental fees and charges, environmental parameters analysis by third part, and maintenance of water treatment units.
- Both sold and liquid waste are generated include paper, plastic, scrap metal, plastic bottles, are further collected in bins on site and then disposed to municipal dumping site through a contractor except hazardous ones which are handled by licensed firm.
- Site have been registered to manage the chemicals by GCLA, its storage is done in the warehouse area with concrete floor. However minor leakage was observed which are managed by use of spill kit.
- Waste water sources include processing waste water and domestic water which are managed by treating (processing) and re use, while the domestic one are storage in septic tank then disposal to municipal waste stabilization pond.
- Portable and waste analysis is conducted by both GASCO and external Laboratories and results are 9.8 mg/l COD, 5.3 mg/l BOD and suspended sold was 2.0 mg/l (waste). While portable was 263.9 mg/l TDS, 1.0 NTU turbidity all parameters analyzed were within the standards.
- Light monitoring is conducted on quarterly bases in offices, control rooms, equipment rooms and warehouse. The Light measured using lux meter and results ranged from 65 -716 LUX.

- Safe handling chemicals, spill management and waste management are among of the environmental awareness conducted to staff to ensure environment protection.
- GASCO compliance to relevant national rules and regulations, general and specific conditions
- Provision of adequate and relevant personal protective equipment to staff to serve their health and safety
- GASCO has prepared and implement Emergency Preparedness and response procedure which is applicable at all operational sites and activated during emergencies situations.

Conclusion and recommendation

Generally, the natural gas pipeline from Mtwara to Dar es salaam and its associated gas processing plant has enormous economic benefits to the nation as currently it contributes to more than 60% to the national grid, supply natural gas to more than 8 industries and 6 institutions in Dar es salaam, Mtwara and Pwani region as a heating and power sources.

The environmental performance for the NNGI operations are at satisfactory level with few deviations observed on light monitoring conducted internally the results indicated that two areas (printer room and ladies' toilet plant) light measurements were slightly below the limit standards. However, it is recommended to increase the frequency of analysis, use of third-party to increase the assurance of results. Furthermore, it is recommended GASCO/TPDC should establish an Environmental Management System in order to have a sustainable system for improving environmental performances. Special attention should be directed to management of waste water from natural gas processing, air emission and solid waste management.

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

Gas Company (Tanzania) Limited is a subsidiary company of Tanzania Petroleum Development Corporation (TPDC), a government owned company based in Dar es Salaam, Tanzania and dully registered under the Business Licensing Act No.25 of 1972(R.E. 2002) with business license number 20000012892. Established under Order (Section 4(1)(f)) and Petroleum Act, 2015 (Section 8(3)) both authorize TPDC to establish subsidiary companies to carry out specific petroleum operations or related activities. Its operations commenced effectively on 1st September, 2014.

The principal duties and responsibilities are operating and maintaining the National Natural Gas Infrastructure (NNGI). The NNGI consists of 551 km of gas pipeline from Msimbati via Madimba (Mtwara Region) and Songo Songo Island (Lindi Region) to Dar es Salaam. The Pipeline has a capacity of 784 mmscfd that can go up to 1002 mmscfd with compression. Also, includes two processing plants at Madimba and Songo Songo with the capacity of 210 mmscfd and 140 mmscfd respectively. Additionally, there are distribution pipelines infrastructures at various take-off points connected to sufficiently supply natural gas to end users from the high pressure pipeline.

In complying with the provisions of the Environment Impact Assessment and Audit Regulations, (GN) No. 50 of 2005 section 1 (a) to (c) as amended in 2018, Gas Company Tanzania Limited decided to prepared and submit to the council a Self-Annual Environmental Audit Report for the financial year 2021/2022 due to the fact that daily operations and maintenance activities might have potential impacts to environmental and social setups.

1.2 PURPOSE AND SCOPE OF THE ENVIRONMENTAL AUDIT

The purpose of this audit was to adhere to the requirement of the Environmental Impact Assessment and Audit Regulations, 2005 (G.N No. 349 of 2005) and the Environmental Management Act, Cap 191 of 2004 (EMA). Section 50 (1) of the Environmental Impact Assessment and Audit Regulations, 2005 requires that in executing project or development, after the environmental impact statement has been approved by the Minister, or after the initial audit of an ongoing project, the proponent or the developer shall take all practical measures to ensure the implementation of the environmental management plan by;

i. Carrying out annual auditing;

ii. Preparing an environmental audit report after each audit and submitting the report to the National Environment Management Council annually or as may be prescribed by the Council; and

iii. Ensuring that the criteria used for the audit is based on the environmental impact assessment process or after the initial audit.

1.3 OBJECTIVES OF ENVIRONMENTAL AUDIT

The main objective of carrying out this annual audit for the NNGI is to meet the requirement of the Environment Impact Assessment and Audit Regulations, (GN No. 349/2005). Environmental audit is a systematic, documented, periodic and objective assessment of the environmental status and performance of properties, facilities, processes, and/or operations.

The specific objectives of this Audit were to:

a) Assess the efficacy of mitigation measures included in the environmental management plan, and to foster additional initiatives to improve the environmental performance of the NNGI;
b) Identify and assess environmental problems associated with the facility, and recommend corrective actions which ensure compliance with applicable

environmental laws and regulations and internal management policies and practices;

c) Identify environmental impacts of the existing and planned operations and assess adequacy of the existing mitigation measures;
d) Propose mitigation measures where applicable;
e) Provide an indication of the measures taken under the environmental management plan to ensure implementation is of acceptable environmental standards;
f) Provide detailed recommendations for corrective activities, their cost, timetable and mechanism for implementation;
g) Assess compliance with relevant statutory and internal requirements; and to
h) Give an opinion on the efficacy and adequacy of the environmental management plan of the project.

1.4 METHODOLOGY USED

In order to address the environmental issues adequately, a team of various experts participated in undertaking the audit. The methodology used in this study included review of the EIS, historical performance, collection of performance data, site visit and interview with different key stakeholders. Environmental impacts were analyzed using simple matrix methodology and expert judgment.

2.0 CURRENT PROJECT STATUS INFORMATION

2.1 PROJECT LOCATION AND ACCESSIBILITY

The NNGI consist of 551 km pipeline networks which crosses four (4) regions Dar es salaam, Pwani, Lindi and Mtwara with two operational offices Kinyerezi station being the pipeline focal operation center and Somangafungu station (Maintenance center). On other hand there are two (2) gas processing plant Madimba located at Madimba village 20KM from Mtwara heading to Msimbati, and lastly Songosongo plant located at Songosongo Island in Kilwa District which about 25 KM from District Headquarters Kilwa Masoko in Lindi region. GASCO headquarter office is located at Plot 1, block D, Kibaga street, Kinyerezi ward, Ilala Municipal, Dar es Salaam Region.

2.2 SITE DESCRIPTION

All GASCO operational sites are located at flat areas, enclosed with both concrete and wire fence for security reasons. In addition, the compounds are paved with concrete, pavements and aggregates which are linked to the storm water drainage system surrounding the gas processing, offices and staff camping site. There is no natural water body around or near the three sites, with exceptional of Songosongo plant which about 300 meter to the Indian ocean.

2.3 LAND OWNERSHIP

The area earmarked for the project is legally owned by TPDC of P.O. Box 1774 - Dar es Salaam which is a GASCO's mother company except where Kinyerezi stations is located it is owned by TANESCO. All developments are according to the letters of offer (titles) and building permits.

2.4 SITE PLAN AND EXISTING STRUCTURES ONSITE

2.4.1 Project Components

The NNGI consists of four (4) sites which Kinyerezi and Somangafungu gas receiving station, Madimba and Songosongo gas processing plants.

2.4.1.1 Gas Processing Plants

The area is categorized into two, processing area and staff camping site. Processing area have series of gas processing units which include gas reception, separation unit, condensate stabilization unit, Dehydration unit, power generation unit, waste water treatment, raw water treatment, gas flaring, gas export, compressor, nitrogen generation, warehouse, office building and control room.

Figure 1: Processing plant

Figure 2: Staff camping site

2.4.1.2 Gas Receiving Stations

There is gas receiving facilities and constructed buildings to support daily activities i.e. equipment house which consists of standby generator, UPS, Switch gear, SCADA system and water tank room, warehouse, filling unit, office building with kitchen and parking sites

2.5 DEPARTMENTS WITHIN THE COMPANY

The Company comprises the following departments/sections:

i. Gas Processing plant
ii. Gas Pipeline
iii. Gas Distribution
iv. Finance and Administration
v. Procurement Unit
vi. Legal services unit
vii. Internal Audit unit

2.6 PROJECT OPERATION PROCESS

2.6.1 Raw Materials

The main raw material is raw gas from upstream wellhead in Msimbati Mtwara and Songosongo in Lindi. The amount of raw gas processed per day depends on specific plant capacity and downstream or customers' demands but for the mean time ranges from **110 mmscfd** to **120 mmscfd** for Madimba plant and **20** to**130 mmscfd** for Songosongo plant depending on. Currently pipeline transport **70** - **140 mmscfd**.

2.6.2 Gas Processing Flow

Raw gas from wellhead is received at Gas reception facilities where preliminary free liquids (condensate and wastewater) are removed from gas, after this stage gas will move to Dehydration and de-hydrocarbon unit where all the remaining

water and heavy hydrocarbons will be removed, at this stage gas is conditioned to meet required gas quality for transportation through export unit to transportation pipeline.

On the other hand, condensate from reception facilities will be stabilized at condensate stabilization unit before storage into tanks. Waste water will be treated on wastewater treatment unit before being used to irrigate camp and plant gardens after compliance with required quality standards.

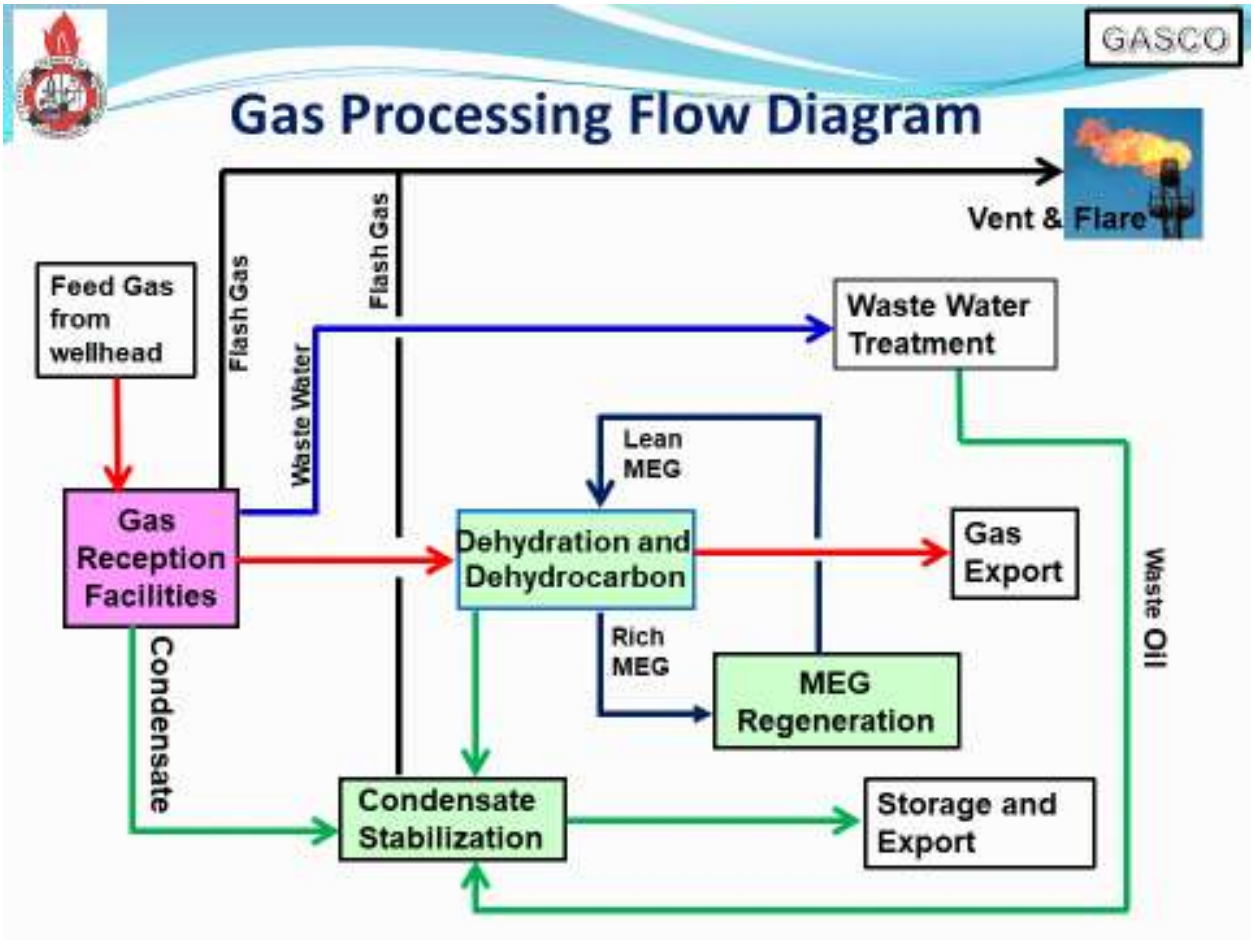


Figure 3: Natural Gas processing flow diagram

2.7 MACHINERIES/EQUIPMENT USED FOR GAS PROCESSING AND TRANSPORTATION

Various types of machineries and equipment are used during gas processing and transportation which are included in the list below; -

i. Gas engines
ii. Refrigeration machine
iii. Gas chromatograph
iv. Gas Export Compressor
v. Flare
vi. Venting stake
vii. Fire engines
viii. Pumps
ix. Meters
x. Valves gas detectors
xi. Condensate stabilization machine
xii. Pig launchers
xiii. Pig receiver
xiv. Cyclones
xv. Filters

Auxiliary unit includes; - Power generation unit, Water treatment units (Portable and Wastewater), Air and Nitrogen unit and Firefighting units

2.8 GENERAL UTILITIES

2.8.1 Water Supply system

The gas processing and transportation is the dry as it doesn't require water at any stage. GASCO Limited obtains water from both sources own boreholes for processing plants and Somangafungu station. DAWASA on other hand supply water for Kinyerezi office. The site boreholes have the capacity to produce 30,000 liters per day. All boreholes have water abstraction permit from Ruvuma water Basin (**Appendix 7**), at Plants and stations water are used for domestic consumption, firefighting purpose and cleaning. Potable water treatment unit is available at each plant to purify before are distributed for use with the capacity of treating 10M^3/hour. On average the facility can produced between 2500- 5400

m^3 per annum. The method used for treating water is reverse osmosis; a technology that is used to remove a large majority of contaminants from water by pushing the water under pressure through a semi-permeable membrane. It is capable of removing up to 99% + of the dissolved salts (ions), particles, colloids, organics, bacteria and pyrogens from the feed water. Figure 4 below shows the reverse osmosis unit and portable water storage tank. In addition, water storage tank capacity at each site is illustrated at the table 1.

Figure 4: Reverse Osmosis unit for portable Water Treatment & Storage tank

Table 1: Water Storage Tank Capacities

S/n	Site name	Water storage tank Capacity (Liters)
1	Madimba Plant	720,000
2	Songosongo Plant	1,000,000
3	Kinyerezi Station	40,000
4	Somangafungu Station	40,000

2.8.2 Power Supply

Kinyerezi and Somangafungu stations are both connected to National electricity grid line supplied by TANESCO. They have diesel standby generators with the maximum capacity of producing kW 80 and kW 120 respectively to be used in case of power outage. However, at gas plants the company has installed a power generation unit which uses processed gas to generate power which satisfy the power demand for each plants. In additional the residential houses at camp site are all installed with solar heaters as alternative source of power. Power are used for keeping the machines running, lighting, heating and other uses. Inspection and maintenance are conducted regular of the onsite power supply system by internal maintenance personnel and occasionally by TANESCO expert depending on the extent and scope of maintenance.

2.9 WASTE MANAGEMENT

2.9.1 Solid Waste Management

The kind of solid wastes generated at the NNG processing and transportation include plastic and metal drums, packaging boxes, plastic bottles, offices waste, cartridges from printers, scrap batteries, food waste and other domestic waste. The solid waste generated at each site is portrayed at the table 2.2 below

Table 2: Waste Generation at each Operational Site

S/n	Waste Category	Madimba Plant	Songosongo Plant	Gas Pipeline
1	Empty drums	96 drums/annum	129 drums/annum	0 drums/annum
2	Plastic	3286.4 kg/annum	229.2 kg/month	1034.5 kg/annum
3	Food waste	37139 kg/annum	600kg/month	3759 kg/annum
4	Paper waste	2886 kg/annum	300kg/Annum	508.79 kg/annum

5	Scraps metal	891 kg/annum	8-10 tones (6 years collection)	0 kg/annual
6	Medical Waste	53 kg/annum	35 kg/annum	N/A

Figure 5: waste collection bins

2.9.2 Liquid Waste Management

Raw gas comes from the well with water being one of the component, are removed with other contents during processing and are termed as waste water. Approximately 50 M^3/day liters of waste water are generated from gas processing per day, and are directly sent to waste water treatment plant on site for treatment. The treatment unit has the capacity to treat 72 M^3/day. On other hand, waste waters are sourced from domestic uses which includes on site kitchen and toilets

The wastewater test results for the Madimba gas plant (Appendix 9) have been summarized into three categories: Physical and Chemical Results, Heavy Metals Test Results, and Bacteriological Test Results.

In the Physical and Chemical Results (Table 1 in Appendix 9), various parameters were assessed against established TZS 860:2006 standards. The temperature of the wastewater was measured at 28.9°C, falling within the acceptable range of 20-35°C. The pH level was recorded as 7.3, aligning with the optimal range of 6.5-8.5. Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) were found to be 5.3 mg/L and 9.8 mg/L, respectively, both passing the standards of 30 mg/L and 60 mg/L. Other parameters such as Oil & Grease, Turbidity, Color, and various dissolved solids were all within permissible limits.

Table 2 in Appendix 9 presents the Heavy Metals Test Results, where concentrations of different heavy metals were measured. Metals like Aluminum, Chromium, Cobalt, Nickel, Copper, Zinc, Cadmium, Mercury, Lead, and Arsenic were assessed against established standards, and all results were well below the permissible levels, indicating effective management of heavy metals.

The Bacteriological Test Results in Table 3 reveal the absence of Total Coliform Organisms and Fecal Coliforms in the wastewater, highlighting the effectiveness of the treatment system in eliminating harmful bacteria and pathogens.

The results indicate compliance with the TZS 860:2006 standards for physical-chemical, bacteriological, and heavy metals parameters. It is recommended that regular monitoring be continued to ensure ongoing compliance and further assurance of the wastewater treatment efficiency.

2.10 HEALTH AND SAFETY

The company deployed several safety measures to protect both employees, equipment and public at large, some of them are engineering, administrative

and protective gears. Installations of gas detectors, automatic fire suppression are example of engineering ones, while establishment of safety procedures, policies, provision of emergency equipment and supervision follow under administrative measures

2.11 SECURITY

The company has a dedicated unit (Security Intelligent Management Unit) to oversee all security matters across all NNGI and establish required security measures. The security measures considered so far include payed agreement between GASCO/TPDC and village and Mtaa leader where NNGI, deploying significant number guards at each operational site, MoU with Tanzania police force, intrusion senses, entrance and exit gate scanners, 24/7 CCTV cameras monitoring and both wire and concrete fencing. Furthermore, security matters are discussed and reviewed at management level.

3.0 COMPLIANCE TO ENVIRONMENTAL LEGISLATIVE AND REGULATORY FRAMEWORKS

Policy, legal and administrative frameworks are the basis of Environmental Impact Assessment (EIA) and Environmental Audit (EA). A policy framework is required to provide broad guidelines on areas of focus in undertaking environmental management activities in the sector. A legal and regulatory framework is essential for providing mandate, allocating specific responsibility and accountability to key actors and stakeholders, and also prescribes and enforces specific operating environmental procedures and standards. Finally, an institutional framework is required to develop policies, guidelines and plans; to ensure compliance with laws and regulations; and to monitor, review and adapt policies, plans and regulations in the light of experience.

This section discusses the relevant sector policies and legislation, which are relevant to environmental and social issues pertaining to the operation of the Natural National Gas Infrastructures. These has been done to gauge compliance of the operations to legal requirements and where is found to be non-compliant or inadequate, measures have been recommended to bring in line with the requirements. This Environmental Audit, therefore, assesses compliance of the NNGI operations to these policies and legislations.

3.1 POLICIES RELEVANT TO THE PROJECT

The following are relevant sectoral and cross – sectoral policies, which provide directives on how projects should be operated in/on environmental components, concerned natural resources and sensitive ecosystems. GAS COMPANY (T) LIMITED is committed to respect these policies in its operations, in some instances it is providing contribution towards implementation of these policies through its activities. Table 3.1 provides an analysis of policy and legal regime compliances.

Table 3: Relevant Policies Compliance

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
1	The National Environmental Policy (URT, 1997)	Environmental audits/inventory shall be carried out	Environmental audit has been carried out	None, the ESIA was conducted earlier	Continue to conduct an annual Environmental Audit annually as per EMA, 2004.

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
		Sections 28 and 29; All projects should use environmentally sound technologies (i.e. those that generate no or low waste or protect environment) Section 56 (f); Workers' health should be adequately protected from environmental health hazards.	The Company has installed gas flaring mechanism to ensure no methane are discharged in the air in steady are burnt to Co_2 which is not a global warming comparing to CH_4	N/A	N/A

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
2	The National Land Policy (URT, 1996)	Protection of land resources from degradation for sustainable development; and proper land use management should be advocated and followed.	The land was secured legally	The lease agreement is still under the name of TANESCO for Kinyerezi gas receiving station	TPDC management should consult TANESCO so as to complete the procedures for transfer of the title deed.
3	The Sustainable Industrial Development Policy (SIDP 1996-2020)	Environmental Audit and appropriate mitigation measures should be enforced	Environmental audit has been carried out	None	Continue to conduct an annual Environmental Audit annually as per EMA, 2004.

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
		Propagating efficient use of raw materials and energy	The company is striving to use energy efficiently, the company has installed its gas engines to generate power for plants sites, energy saver lights, solar heaters and solar systems for powering equipment.	Inadequate sensitization on efficient use of water and energy to workers.	Adopt RECP concept which will enhance proper use and management of resources i.e. energy and water
		Elimination of toxic or dangerous materials,	Neither toxic nor dangerous materials are used in the operations	None	-
4	The National Water Policy (URT, 2002)	Water users should avoid contaminating water sources.	Waste water treatment unit in place, and waste water is collected into a septic tank on site and	None	Conduct regular monitoring of waste water parameters and the sewage

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
			then emptied by contracted company for disposal at the designated area		systems at all sites.
5	The Energy Policy of Tanzania (URT, 2003)	Section 5.1 stipulates the importance of conducting energy audit.	None	Energy audit has not been done	Conduct regular energy audits
		Industrial energy conservation. Energy loses should be reduced	Energy saver lights, photocell lights are installed at all site, regular energy saving awareness is provided	No energy saving policy in place	Establishment of energy saving policy
6	The National Health Policy (URT, 2003)	Protection of workers against all health hazards which	Workers are provided with some protective gears like mask for dust	Non	

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
		occur in industries	protection. Annual medical checkup conducted		
7	The National Employment Policy (1997)	Provision of HIV/AIDS information and education in the workplace targeting the behavior and attitudes of employees and employers	HIV/AIDS awareness training is conducted yearly to all staff	None	-
9	The National Policy on HIV/AIDS, (URT, 2001)	Discourage pre-employment HIV screening	HIV/AIDS test is not the pre requisite for employment at GASCO/TPDC	None	-
10	Tanzania Vision 2025	Promote poverty reduction.	The company employs people from the communities around who are working in	None	None

S/N	Policy	Requirement	Compliance Measures	Deficiency	Corrective Measure
		Achieve semi-industrialized and middle income economy by 2025. Promotion of investments.	various project activities. Also it is paying taxes to the Government and these may be used to invest in poverty reduction activities.		
11	National Poverty Reduction Strategy II	Enhance productivity and Promotion of investments.	By investing in Natural gas contributed to the national efforts to promote investments.	None	None

Table 4: Relevant Legislation Compliance

S/N	Legislation	Requirement	Compliance Measures	Deficiency	Corrective Measure
1	Environmental Management Act, cap 191	Periodic Environmental Audits	This is the annual environmental audit	None	Continue to carry out annual environmental audit for compliance monitoring and control
		As land user and occupier to protect, improve and nourish the land and using it in an environmentally sustainable manner, (S. 72)	Liquid wastes are collected in onsite septic tanks and then emptied by municipal trucks for disposal at the designated area. Also, trees planting at all sites	None	Conduct regular monitoring
		Control, manage and dispose in a sound manner waste including litter, liquid, gaseous and hazardous wastes (Part IX).	Liquid wastes from process activity and domestic use are treated and reused at processing plants. While at stations are collected into septic tanks and emptied by Municipal trucks	None	Conduct regular monitoring
2	The Occupation Health and Safety Act,	Provision of safety gear and regular health checks – in section 24, A thorough pre-placement and periodic and occupational medical examination for	GASCO/TPDC conduct periodic medical checkup of all employees, annual inspections of facilities and equipment, statutory trainings,	Non	Ensure timely compliance

	2003 (Act No. 5/2003)	fitness for employment and for employees shall be carried by a qualified occupational health physician or where necessary a qualified medical practitioner as may be authorized by the chief Inspector and section 62, defines the requirements, responsibilities of the employer; "Where in any factory or workplace, workers are employed in any process involving exposure to any injurious or offensive substance or environment, effective protective equipment shall be provided and maintained by employer for the use of the persons employed".	provision of safe drinking water, first aid kits and first aiders available and provision of all require personal protective gears Compliance certificates for all sites are available (**Appendix 3**)		
3	The Water Resource Management	Not to pollute water bodies	Liquid wastes treated and reused. All sites are paved to avoid any oil seepage	None	Conduct regular inspection of waste water, oil and chemical

	Act, Act No. 12 of 2009		Chemicals are stored in as designated are with chemical band All oil containers are installed with secondary containment		management systems i.e. septic tanks
4	The Public Health Act, 2008	Prohibitions on indirect discharges of any matter likely to injure the sewer or drainage system	No direct discharge at any GASCO/TPDC operational site. All Liquid wastes from washrooms, kitchen are treat or store in septic tanks	None	-
5	The HIV and AIDS (Prevention and Control) Act of 2008	Employer is required to coordinate a workplace program on HIV and AIDS	HIV/AIDS awareness training is provided to all staff annually	None	-
6	Tanzania Investment Act Cap 38	EIA requirement before investment	Environmental Impact Assessment (EIA) was conducted before commencement of construction work	None	-
7	The Workers Compensation Act, 2008 -	Provide compensations to employees for disablement or death caused by or resulting from injuries or diseases sustained or	GASCO/TPDC is the member of WCF	None	Ensure compliance with the provisions of the Workers' Compensation Act.

	(Act No. 20/2008)	contracted in the course of employment			
8	The Employment and Labor Relations Act, No.6 of 2004)	Provide broad protection against discrimination	Women and men are guaranteed the right to a safe and healthy environment.	None	-

4.0 IMPLEMENTATION STATUS OF THE GENERAL AND SPECIFIC CONDITIONS ATTACHED TO THE EIA CERTIFICATE

TPDC/GASCO implement and comply to all the conditions stipulated in the EIA certificates

Table 5: General and Specific Condition attached to EIA Certificate implementation status

CONDITION	STATUS
This certificate is valid during the whole lifecycle of this specific project unless henceforth revoked or suspended	Certificate available and valid
The minister shall be notified of any transfer/variation/surrender this certificate	No changes on the certificate so far
Observe all relevant national policies and legislation that guide this specific project throughout its lifecycle	Comply to all national policies and legislation (Table 3&4)
Ensure safe disposal of all type of wastes (solid or liquid) in specified sites	All wastes are disposed as per EMA2004 and Solid waste, once required disposal permit requested (Appendix 13)
Ensure environmental sustainability by avoiding any form of pollution by using most viable management techniques	No pollution in our surrounding environment, treatment and reuse of waste water and gas flaring are adopted
Adhere to the Environmental Management Plan (EMP) and Monitoring Plan (MP) and constantly improve and update them by taking into account any new development	TPDC/GASCO adhere to the EMP and MP (Table 7)

Constantly liaise with relevant authorities and consult stakeholders including local communities in case of any new development or changes as regards to implementation of your project plan activities	No new development done so far
Adhere to all proposed mitigation measures as specified in the Environmental Management Plan contained in the Environmental Impact Statement	TPDC/GASCO adhere to all proposed mitigation measures in EMP
Abide to all national social and environmental safeguard polies and standards and strive and constantly improve standards	TPDC/GASCO all the time abide to national social and environmental polies and standards
Prepare an Emergency and Contingency plan and put in place risk and safety measures	TPDC/GASCO has prepared Emergency and contingency plan and has put in place risk and safety measures
Conduct Periodic Environmental Audits and facilitate monitoring by relevant authorities	Annual report prepared
Design and implement and internal environmental and safety policy and awareness Program	TPDC/GASCO has designed and implement Health Safety and Environmental policy (Appendix 14)
Prepare annual Environmental Reports and any other reports requested by competent authorities and the Government	TPDC/GASCO prepare annual Environmental reports and other reports requested by other authorities
Obtain all other relevant permits	TPDC/GASCO has obtained all relevant permits including, OSHA

	compliance, Fire safety certificate, TAEC license, GCLA certificate, Water use permit (Appendix 3,4,5,6,7 & 8)

5.0 AUDIT FINDINGS (STRENGTH AND WEAKNESS)

5.1 SAFETY AND ENVIRONMENTAL MANAGEMENT POLICY

Gas Company (T) Limited has a written Health Safety and Environmental management policy which play as the tool to monitor and implement accordingly the major safety and environmental threats/issues at all operational sites. The policy covers commitment on ensuring no pollution to our daily activities and deploying technological measure to prevent any form of pollution. To ensure well understand of the policy, it is displayed at every site.

5.2 CHEMICAL HANDLING- STORAGE, SPILLAGE AND LEAKS

The Main site which handle chemicals in large quantity are the gas processing plants (Madimba and Songosongo) These sites have been registered to Manage the chemicals by GCLA. Storage is done in the warehouse area. During the audit these were the findings on chemical handling:

i. Chemicals are stored in the warehouse and a chemical shed area (figure 6)
ii. Stocked spill kits (figure 7) are available at the spill and leak prone area (warehouse and generator room) for spill emergency purpose, these are inspected regularly and workers are trained on how to use.
iii. Broken Chemical solvents containers/ Glasses are stored in a specified bin in the waste transfer station awaiting disposal figure 8.
iv. SDS were observed to be placed in chemical storage area and laboratory. Workers are trained in handling and management of chemical through GCLA Southern Zone Laboratory

Figure 6: Chemical Storage Shed

Figure 7: Stocked spill Kit

Figure 8: Chemical containers and glasses Bin

5.3 WASTE MANAGEMENT

5.3.1 Solid Waste Management

Solid waste generated at GASCO consist of papers from office activities, food remains and packaging materials; scrap metals from replaced spare part, plastics bottles, and unwanted office furniture's. The audit identifies the following; -

i. Significant number of marked collection bins according to waste category on site at different waste generation location.
ii. Non Hazardous Wastes disposal carried out by the service provider for site cleaning and are all required to be disposed in approved municipal dumping sites. For example, in Songosongo Island are stored in transfer station before being removed for disposal at Kilwa Masoko under the supervision of Kilwa Masoko District Environment Officer, Madimba all wastes are taken to Mtwara Landfill and at Kinyerezi station wastes are taken to Pugu Kinyamwezi. All evidence like municipal waste disposal receipt are kept filled.
iii. The company contracted a licensed medical waste contractor TINDWA to manage all medical waste disposal
iv. Pileup of scraps metals, waste oil and empty drums were observed at Madimba and Songosongo waiting for government approval to dispose them.

5.3.2 Liquid Waste Management

The main liquid wastes include; waste water from gas processing, laboratory and domestic activities, waste paints, used oils and sanitary water from kitchen, toilets. The following were observed during audit.

i. Waste water treatment plant available and working with the capacity of 72m^3/day at Madimba and Songosongo Gas Processing Plants
ii. Somangafungu and Kinyerezi main waste water sources are sanitary and kitchen activities which are stored in Septic tanks and when full are taken by registered municipal cesspit emptier.
iii. Significant amount of wastewater is produced at processing plants unlike gas receiving stations.
iv. After treatment of waste water are re used for watering plants and grasses
v. External wastewater analysis is conducted annually as the means of internal lab performance check which conducts its quality check on monthly basis.
vi. Waste water discharged in the municipal sewer system are not monitored
vii. No waste water drainage system layout which shows yard gullies network posted at the processing areas.

5.4 AIR POLLUTION MONITORING NOT CONDUCTED

During the audit, it was found that air pollution analysis was not conducted at any site regardless the presence of air pollution sources and producing emission like gas flares, gas engines, compressors and standby generators. However, plans are in place to ensure a third engaged to carry out this important environment aspect.

5.5 LIGHTING/ILLUMINATION

Good lighting in the workplace promotes a reduced risk of occupational accidents and health problems, better concentration and accuracy in work. A brighter cleaner workplace results in a more active, cheerful environment and

also improved work performance. It also improves accuracy, increases work speed and enhances production.

NNGI are positioned outdoor, lighting isn't a problem at gas processing and transportation facilities. However, Light measurements conducted at different office using a lux meter revealed that the lights are within the recommended standards except two areas at Processing plant Madimba (Ladies toilet and printer room). Table 5.1 shows lights measurement taken in various sections within the three GASCO operated sites.

Table 6: Light measurements at various GASCO Operated sites

S/N	SITE	LOCATION	MEASURED VALUE (LUX)	STANDARD (LUX)	REMARKS
1	Pipeline Station	Control Room	731	200-750	Acceptable
		Offices	427	200-750	Acceptable
		Store	264	200-750	Acceptable
		Dining	658	200-750	Acceptable
2	Madimba Plant	Control Room	716	200-750	Acceptable
		Offices	425	200-750	Acceptable
		Laboratory 1	566	200-750	Acceptable
		Board room	361	200-750	Acceptable
3	Songosongo Plant	Control Room	590	200-750	Acceptable
		Offices	248	200-750	Acceptable
		Laboratory 1	103	200-750	Above
		Board room	245	200-750	Acceptable

Source: Field measurements June, 2023

5.6 ALLOCATION OF FUNDS FOR ENVIRONMENTAL MANAGEMENT

GASCO allocate specific budget annual to manage and implement all safety and environmental matters. These include budget for annual environmental fees and charges, environmental parameters analysis by third part, and maintenance of waste and potable water treatment units. Safety and environmental issues in this respect is given a high priority to be taken on board but rather it is taken as

part and parcel of normal operation expenses of the company by the management.

5.7 HEALTH AND SAFETY HAZARDS

All personnel in the production area provided with all required PPE. Other PPEs like safety boots, ear masks and uniforms are not provided. All workers are trained to use fire extinguishers. The fire extinguishers are installed in different areas of the factory building. In compliance with the OHS Act 2003, the company is also required to seek for professional assistance from the Government through the Occupation Health and Safety Authority (OSHA), to conduct regular inspection of the factory and do health checkups of the workers.

5.8 ENVIRONMENTAL AWARENESS

GASCO management is aware of issues regarding environmental management and has taken into consideration important steps to ensure that good environmental practices are implemented, conducted, and monitored in fulfilling services required. The management takes necessary measures for example provision of chemical handling and management, waste management, spill management and Health and Safety training to staff and contractors from at least once a year in order to ensure best workplace safety. This aims at reducing environmental incidents, accidents and illness at work.

5.9 COMPLYING WITH NATIONAL POLICIES

GASCO-TPDC to large extent complies with various national policies and laws. It complies with Environmental policy, Investment policy, employment policy and other national policies as described in the policy framework. In addition, this Audit is among the voluntary compliance that GASCO is committed to in order to improve environmental management and ensure sustainable development of the National Natural gas infrastructure.

5.10 PROVISION OF PPE

The workers at all GASCO operational sites are provided with personal protective equipment (PPE). The most common PPE that are used in these sites include fall arrest belt, antistatic suit, overalls/overcoats, safety boots, helmets, gloves, etc. Every worker is supposed to use PPE whenever at workplace and he/ she is not allowed to enter at the site without PPE.

5.11 EMERGENCY RESPONSE AND PREPAREDNESS

Emergency preparedness and response is among the best industrial practice which should be taken into considerations. During audit, the following were observed regarding emergency preparedness and response.

i. The GASCO Sites have Emergency Preparedness and response procedure in place taking into consideration the different emergencies situations each site may face
ii. The plant and receiving stations are equipped with state of the art Gas and flame detection systems, to identify leaks and naked flames
iii. The present of fire extinguishers to be used in case of fire event; are equipped with information regarding date of next services, positioned at several parts of the processing plant, office building, workshop, warehouse and staff camping site. These are inspected every month (internally) and serviced on annually basis through a certified dealer.
iv. Presence of water based fire extinguishing equipment, e.g. Fire monitors and fire hydrants (figure 9).
v. Mock drills are conducted to test the response of workers and increase awareness (figure 10).
vi. Present of fire alarm system in all buildings to alert workers in case of fire event
vii. Existing of emergency assembly point for gathering during emergency
viii. Reverse parking procedure, for easy rescuer in the event of emergency

ix. Emergency spill kits are available, procedure on how to use is posted and workers are trained on how to use them.
x. Significant number of exit doors in case of emergency
xi. First aid kits, and first aiders considering both genders are available at site
xii. No panic alarms in isolated rooms like power generation house

Figure 9: Fire hydrant and fire monitors

Figure 10: Fire Drill and Medical Evacuation of injured personnel

5.12 ADEQUACY INFORMATION

Effective communication and awareness helps to improve Environmental pollution, Health and Safety at workplace. For example, knowing the nature of chemical, impacts of spills in the environment and the prevention measure would help workers to reduce pollution. There are different ways of providing information to workers and visitors at GASCO site with regards to environmental, health and safety. Audit identifies the following regarding.

i. Site safety induction; both new workers and visitors are inducted to be aware with Environmental and safety procedures to be followed on site. These include the use of personal protective gears, site layout, emergency procedures, hygiene and others depending on the individual context.
ii. Internal and External training is conducted through the HSE department and Statutory Institutions e.g. Fire and Rescue Force, GCLA and OSHA.
iii. Adequate safety signs are posted in different location of the site to inform, prohibit and precaution workers or visitors on a particular hazards figure 16.
iv. Environment, Health and Safety training are conducted regularly to enhance staff awareness.
v. Environmental matters are discussed during management meeting, which is held once per month.

Figure 11: Practical Fire Fighting Training

Figure 12: Safety signboard on pipeline and within Gas Processing Plants

5.13 ISO 14001 IMPLEMENTATION

GASCO-TPDC is in the transformation stage to implement and be certified to the ISO 14001 (Environmental management system), which require formulation of environmental policy *(Appendix 14)*, plan, objectives and key performance indicators. Environmental monitoring system for the parameters is established and implemented for surveillance purpose to ensure compliance with emission, use and discharge standards and continuously improves environmental performance.

6.0 ENVIRONMENTAL MONITORING PLAN

The Environmental and Social Impact Assessment (ESIA) for this project was conducted in 2012 and the report contained the Environmental Management Plan and Monitoring Plan. The company conduct regular monitoring of important environmental parameters as described in the ESMP and EMP. Table 6.1 Below present the monitoring data for all important parameters.

Table 7: Status on the implementation of Environmental Monitoring Plan

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
Wastewater generation (Sewage, and Process wastewater)	Generation rate	Twice a year		m^3/d	Flow meter	$3m^3/h$ and $5m^3/h$ for sanitary and process wastewaters respectively (As per design)	GASCO/ TPDC	$50m^3/d$ and $2m^3/d$ for sanitary and process wastewaters respectively
Wastewater characteristics (Treated sewage and process wastewater)	pH	Quarterly a year	11			6.0-9.0	GASCO/ TPDC	Treated waste water analysis done internally by our laboratory. Every quarter analysis is done by External laboratory ***(Attachment 08)***
	COD		11	mg/L	Digestion method	60		
	BOD5		11	mg/L		30		
	TSS		11	mg/L		100		
	Oil and grease		11	mg/L		10mg/L		
	Chloride		11	mg/L		250		
	Sulphate		11	mg/L		500		
	Fluoride		11	mg/L		4.0		

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
Wastewater characteristics	Iron		11	mg/L	Spectrophotometer	5.0		
	Manganese		11	mg/L	EDTA Titrimetric method	5.0		
	Copper		11	mg/L	AAS	0.5		
	Lead		11	mg/L	AAS	0.01		
	Arsenic		11	mg/L		0.01		
	Chromium (total)		11	mg/L	AAS	1.0		
	Zinc		11	mg/L	AAS	5.0		
	Faecal Coliform		11	No/100mL	Membrane filter	1,000 counts/100mL		
	Total Coliform			No/100mL	Membrane filter	10,000counts/100mL		
						-		
	Chlorine (Cl_2/HOCL) doze		Disinfection unit	mg/L		-		0.2 liter/hour for both portable and wastewater treatment systems

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
Chemicals utilization	Quantity of chlorine per day	Twice a year	Disinfection unit			-	GASCO/ TPDC	200 liters/ month
	Ferric chloride		Treatment area			-		20 liters/month
	Cationic polymer (Priestol)					-		2kg/month
	Anionic Polymer (Magna floc)					-		2kg/month
	Caustic soda (powder)					-		50 liters/month
	Caustic Soda (Liquid)					-		25kg/ month
Safety and health risk	Personal Protective Equipment (PPE)	Once a month		Type and No.		-	GASCO/ TPDC	GASCO/TPDC set budget and procure PPE's for her employees every year.

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
								No one is allowed to work in plant without proper PPE's
	Qualified personnel in SHE			No. and Qualifications				GASCO/TPDC has employed six qualified personnel in SHE
	First Aid Kit			Facilities and Medics				GASCO/TPDC has established full site clinic, procured Ambulance and first aid facilities
Air pollution	PM_{10}	Once a year	1	Ppm	Gas detector tubes		GASCO/ TPDC	Air pollution monitoring not conducted.
	$PM_{2.5}$		1	Ppm	Gas detector tubes			

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
	NO_x		1	Ppm	Gas detector tubes			
	SO_x		1	Ppm	Gas detector tubes			
	CO		1	Ppm	Gas detector tubes			
Solid waste	Solid wastes generation rate	Every Month		kg/d	Direct		GASCO/ TPDC	Monitoring of Solid waste management is done every day and analyzed monthly ***(Attachment 11)***
	Recyclable solid wastes			kg/d	Direct sorting			
	Reusable solid wastes			Kg/d	Direct sorting			
	Disposable solid wastes			kg/d	Direct sorting			
Sludge and grits	Quantity of sludge	Twice a year		kg/yr	Direct measurement		GASCO/ TPDC	Monitoring done May and November. November 2022 = 13.17M^3

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
								May 2023 = 20.75M^3
Population	Workers and visitors at site	Once a year		No.		N/A	GASCO/ TPDC	Population of workers, contractors and visitors vary from 90 to 120 people per day
Operation and Maintenance	System, Machines, and units operating procedures			Availability and condition		N/A	GASCO/ TPDC	SOP's developed and implemented
	System, Machines, and units maintenance routines	Every Month		Availability and adherence		N/A		Maintenance schedule developed and implemented
Energy utilization	Electricity	Once a year	Electric meters, gas units and back up	KW		N/A	GASCO/ TPDC	240MW from site installed gas engines
	Gas			Million standard cubic feet (		N/A		Quantity of Natural gas used as a fuel is 103 mmscf per year

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
			generators	mmscf)				
Wastewater treatment efficiencies (Sewage treatment system and Process wastewater treatment system)	Final pH	Once a year			ISO 10523	6.0- 9.0		Waste water analysis were successful conducted on February & June 2023 (Appendix 9)
	COD			mg/L	ALPHA 5220D	60		
	BOD5			mg/L	ALPHA 5110B	30		
	TSS			mg/L	ISO 11923	100		
	Oil and grease			mg/L	Hexane Extractable Gravimetric	10mg/L		
	Copper			mg/L	ICP-OES	0.5		
	Lead			mg/L	AAS	0.01		
	Arsenic			mg/L	AAS	0.01		
	Chromium (total)			mg/L	ICP-OES	1.0		
	Zinc			mg/L	ICP-OES	5.0		
	Faecal Coliform			CFU/100 mL	ISO 9308-1	1,000 counts/100mL		

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
	Total Coliform			CFU/100 mL	ISO 9308-1	10,000counts/100mL		
Hygiene condition	Personal hygiene	Every Month	Treatment plants area		Checklist	N/A	TPDC/GASCO	TPDC/GASCO has contracted a company hygiene and housekeeping of our environment. Plant inspection done every month
	Good housekeeping practice				Checklist	N/A		
Waste oil generation and handling	Quantity of waste oils generated	Every month	Oil/water separator	kg/d or L/d		N/A	TPDC/GASCO	TPDC/GASCO has constructed the chemical storage area where all the waste oil is stored. Total of 18,000 liters has been generated. Will be disposed by vendor/contracted company as per NEMC directives
Noise	Noise level	Twice a year	Noise generation	dB	Direct measurement	85 – 120 dB	TPDC/GASCO	Noise survey done every six month ***(Attachment 10)***

ENVIRONMENTAL MONITORING PLAN								
Performance Indicator	**Parameter**	**Monitoring Frequency**	**Sampling area**	**Measurement Units**	**Method**	**Permissible level/standards (TZS 2335: 2019)**	**Responsibility for Monitoring**	**Current Status and Results**
			machines		(decibel meter)			

7.0 CONCLUSION AND RECOMMENDATIONS

In general, the natural gas pipeline from Mtwara to Dar es salaam and its associated gas processing plant has enormous economic benefits to the nation as currently it contributes to more than 60% to the national grid, supply natural gas to more than 8 industries and 6 institutions in Dar es salaam, Mtwara and Pwani region as a heating and power sources. Furthermore, there are more than 1500 houses connected to natural gas services at Mtwara, Dar es salaam and Lindi regions as the source cooking energy, this has further reduced the environmental degradation caused by cutting down of trees for fire woods and charcoal making which is the major source of cooking energy in numerous area in Tanzania.

In other side GASCO operations pose limited environmental and social risks, which include generation of waste both solid and liquid, chances of air pollution once a significant amount of natural gas is released to the air, in case spills and seepage could impact the underground water sources and also once fire emergency happen.

All environmental risks can be minimized and managed through implementing preventive measures and sound management systems. In order to ensure sustainable processing and transportation of natural gas GASCO/TPDC continue to implement the ESMP, EMP, general and specific conditions attached to the EIA certificate and adherence to all relevant rules and regulations. GASCO will also, issue timely conduct and submission of the environmental audit report annually.

Referring the waste water analysis conducted by MITCL the results indicated that total dissolved sold, chlorides, sulphate, total nitrogen, total phosphates and colour were above the TBS standards. It is recommended to increase the frequency of analysis, use of at least two different laboratories to increase the assurance of results. Furthermore, it is recommended that the GASCO/TPDC should establish an Environmental Management System in order to have a

sustainable system for improving environmental performances. Special attention should be directed to management of waste water from natural gas processing, air emission and solid waste management.

Third party air pollution monitoring need to be conducted as per the environmental monitoring plan enclosed in the Environmental Impact assessment report.

8.0 APPENDIXES

Appendix 1: **EIA Certificate and attached General and specific conditions**

GN. No. 349

THE UNITED REPUBLIC OF TANZANIA

ENVIRONMENTAL IMPACT ASSESSMENT

[Section 92(1) of the Environmental Management Act No. 20 of 2004]

Application Reference No. 1536
Registration No. EC/EIS/598
This is to Certify that

M/S. TANZANIA PETROLEUM DEVELOPMENT CORPORATION (TPDC)

of P. O. BOX 2774, DAR ES SALAAM

has this day been granted an Enviromental Impact Assessment Certificate for the proposed project/Activity titled CONSTRUCTION OF A NATURAL GAS PIPELINE, ASSOCIATED GAS PROCESSING PLANTS AND RECEIVING STATIONS

to be implemented/carried out at MNAZI BAY AND SONGOSONGO THROUGH SONGA FUNGU TO DAR ES SALAAM (522KM) IN MTWARA, LINDI, KILWA, RUFIJI, MKURANGA, TEMEKE, ILALA AND KINONDONI DISTRICTS, MTWARA, LINDI COAST AND DAR ES SALAAM REGIONS

This certificate shall remain in force during the whole lifecycle of this specific project unless henceforth revoked or suspended.

General conditions and terms attached to this certificate are set out herein behind and specific conditions are annexed.

Dated this 10th day of MAY 2012

Dr. Terezya Luoga Huvisa (MP)
Minister of State, Vice-President's Office - Environment

GENERAL CONDITIONS OF CERTIFICATE

1. This certificate is valid during the whole life cycle of this specific project unless henceforth revoked or suspended.

2. The Minister shall be notified of any transfer/variation/surrender of this certificate.

3. Observe all relevant national and international policies and legislation that guide this specific project throughout its life cycle.

4. Ensure safe disposal of all types of wastes (solid or liquid) in specified sites.

5. Ensure environmental sustainability by avoiding any form of pollution by using most viable management techniques.

6. Adhere to the Environmental Management Plan (EMP) and Monitoring Plan (MP) and constantly improve and update them by taking into account any new developments.

7. Constantly liaise with relevant authorities and consult stakeholders including local communities in case of any new development or changes as regards to implementation of your project plan activities.

8. Adhere to all proposed mitigation measures as specified in the Environmental Management Plan contained in the Environmental Impact Statement.

9. Abide to all national social and environmental safeguard policies and standards and strive to maintain and constantly improve standards.

10. Prepare an Emergency and Contingency plan and put in place risk and safety measures.

11. Conduct periodic Environmental Audits and facilitate monitoring by relevant authorities.

12. Design and implement an internal Environmental and Safety Policy and Awareness Programme.

13. Prepare Annual Environmental Reports and any other reports requested by competent authorities and the government.

14. Obtain all other relevant permits.

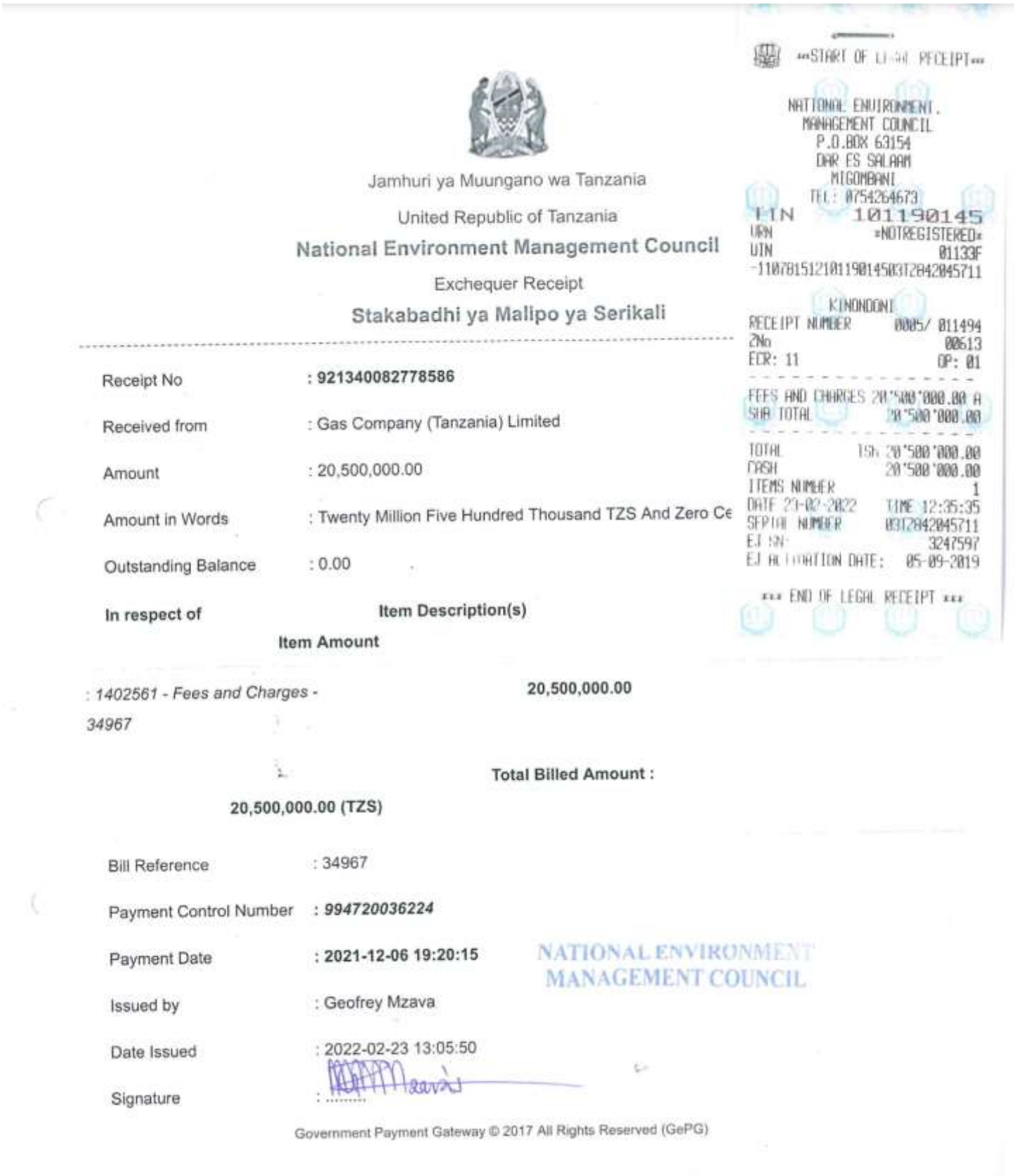
DIRECTOR GENERAL
NATIONAL ENVIRONMENT
MANAGEMENT COUNCIL
P.O. Box 63154
DAR-ES-SALAAM

SPECIFIC CONDITIONS TO TANZANIA PETROLEUM DEVELOPMENT CORPORATION FOR THE PROPOSED CONSTRUCTION OF A NATURAL GAS PIPELINE FROM MNAZI BAY AND SONGONSONGO THROUGH SOMANGA FUNGU AND THEN TO DAR ES SALAAM (522KM) ASSOCIATED GAS PROCESSING PLANTS AND RECEIVEING STATIONS

1. Awareness should be done to the community living around the route.
2. Ensure that an Emergence Preparedness and Response Plan is in place in case of gas leakage and fire outbreak and such plan be annually updated.
3. Ensure that issues of involuntary resettlements are dealt with in accordance with the relevant laws.
4. Ensure that graves removals within the old way leave as raised in Rufiji and Mkuranga Districts are handled with care and according to the provisions of Graves Removal Act No.9 of 1967.
5. Ensure that there is close collaboration and participation with all local government authorities in handling issues to which they are responsible with during the life cycle of the project.
6. Relevant payments including fees and charges prescribed under the Environmental Management (Fees and charges) Regulations, 2008 should be made as required.

DIRECTOR GENERAL
NATIONAL ENVIRONMENT
MANAGEMENT COUNCIL
P.O. Box 63154
DAR-ES-SALAAM

Appendix 2: **NEMC Annual fees and charges**



Jamhuri ya Muungano wa Tanzania

United Republic of Tanzania

National Environment Management Council

Exchequer Receipt

Stakabadhi ya Malipo ya Serikali

Receipt No	: **921340082778586**
Received from	: Gas Company (Tanzania) Limited
Amount	: 20,500,000.00
Amount in Words	: Twenty Million Five Hundred Thousand TZS And Zero Ce
Outstanding Balance	: 0.00

In respect of	Item Description(s)	Item Amount
: *1402561 - Fees and Charges - 34967*		**20,500,000.00**

Total Billed Amount :

20,500,000.00 (TZS)

Bill Reference	: 34967
Payment Control Number	: ***994720036224***
Payment Date	: **2021-12-06 19:20:15**
Issued by	: Geofrey Mzava
Date Issued	: 2022-02-23 13:05:50
Signature	: .....

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL

Government Payment Gateway © 2017 All Rights Reserved (GePG)

«START OF LEGAL RECEIPT»

NATIONAL ENVIRONMENT
MANAGEMENT COUNCIL
P.O.BOX 63154
DAR ES SALAAM
MIGOMBANI
TEL: 0754264673
TIN 101190145
VRN *NOTREGISTERED*
UIN 01133F
-1107815121011901458037204204571 1

KINONDONI
RECEIPT NUMBER 0005/ 011494
ZNo 00613
ECR: 11 OP: 01

FEES AND CHARGES 20'500'000.00 A
SUB TOTAL 20'500'000.00

TOTAL TSh 20'500'000.00
CASH 20'500'000.00
ITEMS NUMBER 1
DATE 23-02-2022 TIME 12:35:35
SERIAL NUMBER 037204204571 1
EJ SN: 3247597
EJ AUTHORIZATION DATE: 05-09-2019

*** END OF LEGAL RECEIPT ***

United Republic of Tanzania

National Environment Management Council (NEMC)

Government Bill

Control Number	:994720048521
Payment Ref	:472022060611423518 59
Service Provider Code	:SP472
Payer Name	:GAS COMPANY T. LTD (SSI)
Payer Phone	:0682539450
Bill Description	:Annual fees and charges for gas processing plant Songo Songo Island for the year 2021/22 invoice no.31183

SCAN & PAY by MPESA or TIGO PESA APPs

Billed Item (1)	:ANNUAL FEES AND CHARGES FOR GAS PROCESSING PLANT SONGO SONGO ISLAND FOR THE YEAR 2021/22 INVOICE NO.31183	:10,500,000.00
	Total Billed Amount	:10,500,000.00 (TZS)
Amount in Words	:Ten Million Five Hundred Thousand Tanzania Shillings Only	
Expires on	:06-Jul-2022	
Printed By	:Sarah Maduhu	
Printed on	:06-Jun-2022	
Signature		

Jinsi ya Kulipa

1. Kupitia Benki: Fika tawi lolote au wakala wa benki ya CRDB, NMB, BOT. Namba ya kumbukumbu **994720048521**
2. Kupitia mitandao ya simu:
   1. Ingia kwenye menyu ya mtandao husika
   2. Chagua 4 (Lipa Bill)

How to Pay

1. Via Bank: Visit any branch or bank agent of CRDB, NMB, BOT. Reference Number **994720048521**
2. Via Mobile Network Operators (MNO):
   1. Enter to the respective USSD Menu of MNO
   2. Select 4 (Make Payment)
   3. Select 5 (Government Payments)

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL [NEMC]

BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

Mikocheni Regent | P.O.Box 63154 | 11404 Dar Es Salaam - Tanzania
Tel: +255 22 277 4852 / +255 22 277 4889 | Fax: +255 22 277 4901 | Mob: +255 713 608 930
Email: dg@nemc.or.tz | Website: www.nemc.or.tz

TIN: 101-190-145

INVOICE

No. 31183

Name GAS COMPANY T. LTD (SSI)

Address P.O. Box 714,
DSM
0682 539450

Date: 06/06/2022

Cert. No.

Location: SONGO SONGO ISLAND
KILWA, LINDI.

Description (Type of Facility / Activity / Project)		Unit Price Tshs.	No. of Unit	Line Total Tshs.
Annual fees and charges for environmental Compliance, Monitoring and Audit for Year 2021/2022	GAS PROCESSING PLANT SONGO SONGO ISLAND.	10,500,000/=	1	10,500,000/=
	TSH. 10,500,000/=			
SUB TOTAL		10,500,000/=	1	10,500,000/=
Outstanding Balance for the year				
Penalty for late payment / Non-compliance for year				
TOTAL		10,500,000/=		10,500,000/=

NOTE

- All Cheques should be written to:
  NATIONAL ENVIRONMENT MANAGEMENT COUNCIL
- Deposited in the Council Account No.
  0150005055800 CRDB BANK - TOWER BRANCH
  20110024189 NMB - BANK HOUSE BRANCH

Issued by: Regis Clark

Signature:

: National Environment Managemen
t Council
Government Bill

BillItem : : ; Annual Fees and
Charges
Payer name : : GAS COMPANY T LIM
ITED
Payer phone: : 0714630836
Amount : : TZS 20,500,000
Pay option : : Exact
Expire date: : 2023-09-10 13:11:
15
Reference : : 9947200756/9

Lipa kupitia Benki (NMB/CRDB)au
Mitandao(MPESA/Tigo Pesa/ Airtel
Money/T-PESA/HaloPesa kwa
kuchagua "Malipo ya Serikali")
Piga namba +255-714 927494 or +2
55-787 626502 kwa maelezo Zaidi.

POS center : HEAD OFFICE
Printed on : 2023-07-12T18:11:25

Signature : .....

**********END OF BILL**********

Appendix 3: **Occupational Safety and Health Authority Compliance Certificate**

OSHA 3

THE UNITED REPUBLIC OF TANZANIA
PRIME MINISTER'S OFFICE
LABOUR, YOUTH, EMPLOYMENT AND PERSONS WITH DISABILITY
OCCUPATIONAL SAFETY AND HEALTH AUTHORITY
THE OCCUPATIONAL HEALTH AND SAFETY ACT NO.5 OF 2003

COMPLIANCE LICENCE

NO. OF REG. CERTIFICATE: 402 501 001 NO: 0918/22/23

Name of the Occupier / Owner: GAS COMPANY (T) LIMITED-SONGOSONGO NATURAL GAS PROCESSING PLANT

Address of Workplace: P.O BOX 714 DAR ES SALAAM

Location of Workplace: PLOT 1/1,BLOCK 1/2,SONGOSONGO.KILWA DISTRICT LINDI

Nature of Work: NATURAL GAS PROCESSING

The occupier / owner has been issued with a compliance licence after fulfilling the requirements of the Occupational Health and Safety Act; and is required to observe the conditions of licence.

Validity Period of Licence: UNTIL JULY,2023

Place of Issue: OSHA HQ - DAR ES SALAAM

Date of Issue: 05-Jan-2023

KHADIJA H. MWENDA
CHIEF INSPECTOR

Note

1. The occupier/owner must comply with The Occupational Health and Safety Act and its subsidiary legislation throughout the validity period of the licence.
2. Non-compliance at anytime can attract legal actions and/or revocation of licence.
3. This certificate should be attached to the General Register

THE UNITED REPUBLIC OF TANZANIA

00001406 OSHA 1B

OCCUPATIONAL SAFETY AND HEALTH AUTHORITY

CERTIFICATE OF REGISTRATION OF A FACTORY/WORKPLACE

I hereby certify that the workplace named below has been dully registered in pursuant of section 17(2) of The occupational Health and Safety Act.5 of 2003.
with registration number

202 101 001

Name of the Occupier / Owner

GAS COMPANY (T) LIMITED - MADIMBA NATURAL GAS PROCESSING PLANT

With Effects from **June 08,2021**

Address and Location: **Plot Plot number 1, Block BLOCK D, Kibaga. Ilala Municipal Dar es Salaam**

Region : **Dar es Salaam** District: **Ilala**

Ward : **KINYEREZI** Street / Village: **Kibaga**

Nature of Work : **Natural gas**

Industrial Classification : **Extraction of natural gas**

SORT CODE

Khadija H. Mwenda
CHIEF INSPECTOR

Note THE REQUIREMENTS UNDER THIS CERTIFICATE ISSUED ARE STATED OVERLEAF

THE UNITED REPUBLIC OF TANZANIA

00006639 OSHA 1B

OCCUPATIONAL SAFETY AND HEALTH AUTHORITY

CERTIFICATE OF REGISTRATION OF A FACTORY/WORKPLACE

I hereby certify that the workplace named below has been duly registered in pursuant of section 17 of The occupational Health and Safety Act Number 5 of 2003 with workplace registration number

402 101 002

Name of the Occupier / Owner

GAS COMPANY (T) LIMITED - KINYEREZI GAS RECEIVING STATION

With Effect from **February 21, 2022**

Address and Location: **Plot Plot No.1, Block BLOCK NO.D, Kibaga. Ilala Municipal Dar es Salaam**

Region : **Dar es Salaam** District: **Ilala**

Ward : **KINYEREZI** Street / Village: **Kibaga**

Nature of Work : **Production and Distribution of Gas Products**

Industrial Classification : **Support activities for petroleum and natural gas extraction**

SORT CODE

Khadija H. Mwenda
CHIEF INSPECTOR

Note THE REQUIREMENTS UNDER THIS CERTIFICATE ISSUED ARE STATED OVERLEAF

Appendix 4: **Fire and Rescue Force Compliance Certificates**

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF HOME AFFAIRS
FIRE AND RESCUE FORCE

Customer Number: 3023 - 310607 99981

FIRE SAFETY CERTIFICATE

(Made under section 32 (g) (iii) of the Fire And Rescue Force Act, No. 14 of 2007)

This is to Certify that

M/S MADIMBA GAS PROCESSING PLANT - MTWARA

is substantially in compliance with the terms and provisions of the Fire Safety Regulations made under section 32 (g) (iii) of Act No. 14 of 2007, after the said building or occupancy has been duly inspected for fire safety.

This Certificate is valid from **16-May-2022** to **15-May-2023**

Control No **994790204335** Amount Paid **Tshs. 5,000,000/=**

Given under my hand this **12th** day of **August, 2022**

J. S. Ikonko
Commissioner for Fire Safety

Signature

For COMMISSIONER GENERAL FOR FIRE AND RESCUE FORCE

Serial No: Q 2021 - 16137

Customer Number: 3024 - 9502203

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HOME AFFAIRS

FIRE AND RESCUE FORCE

FIRE SAFETY CERTIFICATE

(Made under section 32 (g) (iii) of the Fire And Rescue Force Act, No. 14 of 2007)

This is to Certify that

M/S GASCO SONGO SONGO NATURAL GAS PROCESSING PL

is substantially in compliance with the terms and provisions of the Fire Safety Regulations made under section 32 (g) (iii) of Act No. 14 of 2007, after the said building or occupancy has been duly inspected for fire safety.

This Certificate is valid from 10-March-2022 to 09-March-2023

Control No: 994790195759 Amount Paid: TShs. 9,000,000/=

Given under my hand this 1st day of August, 2022

J. S. Ikonko

Commissioner for Fire Safety

Signature

For: COMMISSIONER GENERAL FOR FIRE AND RESCUE FORCE

Serial No: L 2021 - 11233

Customer Number: 3024 - 3215148

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HOME AFFAIRS

FIRE AND RESCUE FORCE

FIRE SAFETY CERTIFICATE

(Made under section 32 (g) (iii) of the Fire And Rescue Force Act, No. 14 of 2007)

This is to Certify that

M/S GASCO COMPANY TANZANIA LTD - GASCO

is substantially in compliance with the terms and provisions of the Fire Safety Regulations made under section 32 (g) (iii) of Act No. 14 of 2007. after the said building or occupancy has been duly inspected for fire safety.

This Certificate is valid from 08-March-2022 to 07-March-2023

Control No: 994790197350 Amount Paid: TShs. 5,000,000/=

Given under my hand this 11th day of July, 2022

J. S. Ikonko

Commissioner for Fire Safety

Signature

For: COMMISSIONER GENERAL FOR FIRE AND RESCUE FORCE

Appendix 5: **Government Chemist Laboratory Authority Compliance Certificate**

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

GOVERNMENT CHEMIST LABORATORY AUTHORITY

P.O. Box 164, DAR ES SALAAM

REGISTRATION CERTIFICATE

(Made under Section 29 of the ICCA CAP 182)

I hereby certify that **M/S GAS COMPANY (TANZANIA) LIMITED** of **P.O. BOX 714, DAR ES SALAAM** with premises at **Plot No. 1, MCHEPA Street, Madimba, Mtwara**, has been approved and registered in Tanzania to operate as **IMPORTER, STORAGE, USER** of chemicals under **Industrial and Consumer Chemicals Act** and granted Registration No. **B006-C000030**

The special conditions attached to this certificate are:

1. **Awarded Full Registration as per Section 22(1) of the Act**
2. **Specific Requirements will apply to Highly Hazardous and Restricted Chemicals appearing in the Third, Sixth, Seventh and Eighth schedule to the Act.**

This certificate remains valid from **December 17, 2020** to **December 16, 2025**

Granted on **December 17, 2020**

Signed:

REGISTRAR

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

GOVERNMENT CHEMIST LABORATORY AUTHORITY

P.O. Box 164, DAR ES SALAAM

REGISTRATION CERTIFICATE

(Made under Section 29 of the ICCA CAP 182)

I hereby certify that **M/S GAS COMPANY (TANZANIA) LIMITED** of **P.O. BOX 714, DAR ES SALAAM** with premises at **Plot No. 1, SONGOSONGO Street, Songosongo, Lindi,** has been approved and registered in Tanzania to operate as **IMPORTER, STORAGE, USER** of chemicals under **Industrial and Consumer Chemicals Act** and granted Registration No. **B006-C000033**

The special conditions attached to this certificate are:

1. **Awarded Full Registration as per Section 22(1) of the Act**
2. **Specific Requirements will apply to Highly Hazardous and Restricted Chemicals appearing in the Third, Sixth, Seventh and Eighth schedule to the Act.**

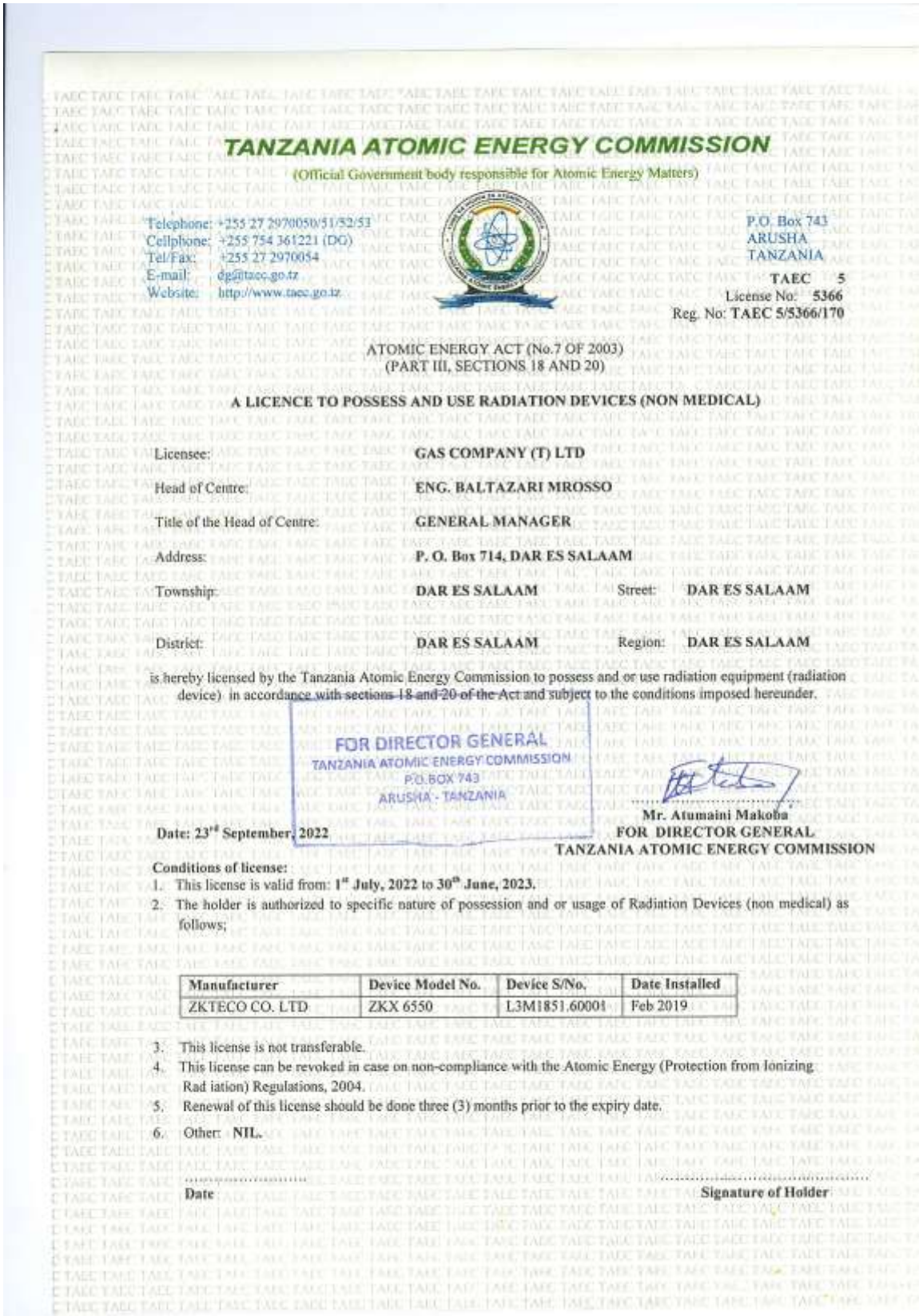
This certificate remains valid from **December 17, 2020** to **December 16, 2025**

Granted on **December 17, 2020**

Signed:

REGISTRAR

Appendix 6: **Tanzania Atomic Energy Commission License**



TANZANIA ATOMIC ENERGY COMMISSION

(Official Government body responsible for Atomic Energy Matters)

Telephone: +255 27 2970050/51/52/53
Cellphone: +255 754 361221 (DG)
Tel/Fax: +255 27 2970054
E-mail: dg@taec.go.tz
Website: http://www.taec.go.tz

P.O. Box 743
ARUSHA
TANZANIA

TAEC 5
License No: 5366
Reg. No: TAEC 5/5366/170

ATOMIC ENERGY ACT (No.7 OF 2003)
(PART III, SECTIONS 18 AND 20)

A LICENCE TO POSSESS AND USE RADIATION DEVICES (NON MEDICAL)

Licensee: **GAS COMPANY (T) LTD**

Head of Centre: **ENG. BALTAZARI MROSSO**

Title of the Head of Centre: **GENERAL MANAGER**

Address: **P. O. Box 714, DAR ES SALAAM**

Township: **DAR ES SALAAM** Street: **DAR ES SALAAM**

District: **DAR ES SALAAM** Region: **DAR ES SALAAM**

is hereby licensed by the Tanzania Atomic Energy Commission to possess and or use radiation equipment (radiation device) in accordance with sections 18 and 20 of the Act and subject to the conditions imposed hereunder.

FOR DIRECTOR GENERAL
TANZANIA ATOMIC ENERGY COMMISSION
P.O.BOX 743
ARUSHA - TANZANIA

Date: 23rd September, 2022

Mr. Atumaini Makoba
FOR DIRECTOR GENERAL
TANZANIA ATOMIC ENERGY COMMISSION

Conditions of license:

1. This license is valid from: **1st July, 2022 to 30th June, 2023.**
2. The holder is authorized to specific nature of possession and or usage of Radiation Devices (non medical) as follows;

Manufacturer	Device Model No.	Device S/No.	Date Installed
ZKTECO CO. LTD	ZKX 6550	L3M1851.60001	Feb 2019

3. This license is not transferable.
4. This license can be revoked in case on non-compliance with the Atomic Energy (Protection from Ionizing Rad iation) Regulations, 2004.
5. Renewal of this license should be done three (3) months prior to the expiry date.
6. Other: **NIL.**

.....
Date

.....
Signature of Holder

Appendix 7: **Water Use Permit**

Form F

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

RUVUMA AND SOUTHERN COAST BASIN WATER BOARD (RSCBWB)

GRANT OF A WATER USE PERMIT

The Water Resources Management Act. No.11 of 2009

(Section 43)

Water Use Permit No: **RSCBWB / WUP 41100953 / 2022** District: **MTWARA RURAL**

Zone/ Catchment: **LOWER RUVUMA** Region: **MTWARA**

1. Name of Holder: **GAS COMPANY (T) LIMITED**
2. Address: **P.O. BOX 714, DAR-ES-SALAAM.**
3. Particulars of Water Use Permit: **To Use 150 m^3/day of Water for Domestic purpose located at Madimba Village, Subjected to Water Quality Analysis Report.**
4. This Water Use Permit is: **Personal to the Grantee and may not be transferred Without the Consent of the Basin Water Director.**
5. Works Required: **Installation of Flow Meter.**
6. Whether grant is subject to construction of works specified in paragraph 5 and date by which works to be completed:

   Civil works completed to the satisfaction of the Basin Water Director.
7. This Water Use Permit is granted subject to the provisions of the Water Resources Management Act No.11 of 2009 and the Special Terms and Conditions Specified Overleaf.

BASIN WATER DIRECTOR RUVUMA AND SOUTHERN COAST BASIN P.O. Box 141 MTWARA

Date; 25th November, 2022

Jumanne S. Mpemba
Basin Water Director

Appendix 8: **Natural Gas Processing License**

UNITED REPUBLIC OF TANZANIA
MINISTRY OF ENERGY
ENERGY AND WATER UTILITIES REGULATORY AUTHORITY
(EWURA)

NATURAL GAS PROCESSING LICENCE

LICENCE NO. NGPL – 2021 – 002

(Issued pursuant to Section 133 of the Petroleum Act, Cap. 392)

This Natural Gas Processing Licence is hereby granted to **Gas Company (Tanzania) Limited** with its registered office at **Plot No. 1, Block D, Kibaga Street, Kinyerezi Gas Receiving Station, P.O. Box 714 Dar es Salaam** to undertake natural gas processing activities subject to the terms and conditions appended herewith.

This licence is valid from 16th day of August, 2016 and shall remain in force until 15th August, 2041 unless revoked, renewed or extended by the Authority.

26th July, 2021
Date of Issue

Eng. Godfrey H. Chibulunje
Director General

Kapwete John
Secretary to the Board

SEAL

EWURA House, Plot No 3, Block AD, Medeli West, P.O. Box 2857, Dodoma Tel: +255 26 2329003-4, Fax: +255 26 2329005
E-mail: info@ewura.go.tz • Website: http://www.ewura.go.tz

Appendix 9: **Waste Water Monitoring Results**

	United Republic of Tanzania	
	Ministry of Water	
		Mtwara Zonal Water Quality Laboratory
		P.o. Box 141, Mtwara
		Email: mtwlab@maji.go.tz
REQUESTED BY:	MADIMBA GAS PLANT	
REQLI ESTED FOR:	DISCHARGE PERMIT	
.M7'RZWQL/L:4B. No.	503/22/23	

WASTEWATER TEST RESULTS

Table 1: Physical and chemical results

Physical parameters and chemical parameters					
Parameters	Method Code	Units	Laboratory Results	Standards NZS 7a9:J018	Remarks
Temperature	MTRZWQL-ISO 10523	°C	28.9	20-35	Pass
Ph	MTRZWQL-ISO 10523		7.3	6.5-8.5	Pass
BOD	ALPHA5110B	mg/L	5.3	30	Pass
COD	ALPHA 5220D	mg/L	9.8	60	Pass
Oil & Grease	Hexane Extractable Gravimetric	mg/L	<1	10	Pass
Turbidity	MTRZWQL-ISO 7027	FTU	3.0	50	Pass
Colour	MTRZWQL-DR-8025	PtiCo	0	25	Pass
Total suspended solid {TSS	MTRZWQL-ISO 11923	mg/L	2.0		Pass
Total dissolved solid (TDS)	MTRZWQL-ASTM D 5907-1	mg/L	411.7	1500	Pass
Fluoride	MTRZW§L-ISO 10359	mg/L	0.82	8.0	Pass
Chloride	MTRZWQL-ISO 9297	mg/L	169.32	400	Pass
Calcium	MTRZWQL-ISO 7980	mg/L	25.38	150	Pass
Magnesium	MTRZWQL-ISO 7980	mg/L	5.381	100	Pass
Sodium	MTRZWQL-ISO 9964	mg/L	104.4	200	Pass
Potassium	MTRZWĄL-ISO 9964	/L	10.44	50	Pass
Nitrate	MTRZWQL-ISO 7890	mg/L	35.6		Pass
Total phosphorus (as P)	NTRZWQL-ISO 15681	mg/L	6.65		Pass
Sulphate	**MTRZW L ISO 22743**	**mg/L**	**32**	600	Pass
Iron	MTRZWQL-ISO 6332	mg/L	0.07	1.5	Pass
Manganese	MTRZWQL-ISO 6333	mg/L	0.019	0.8	Pass
Total residue Chlorine	MTRZWQL-ISO 7393	mg/L	0.08	0.2-0.5	Pass

Table 2: Heavy Metals test result

Metals TEST					
Parameters	Method Code	Units	Laboratory Results	Standards TZS 860:2006	Remarks
Aluminum	ICP-OES	m /L	0.067	2.0	Pass
Chromium (Total}	ICP-OES	mg/L	0.006	1,0	Pass
Cobalt (Co)	ICP-OES	mg/L	<0.001	1.0	Pass
Nickel (Ni)	ICP-OES	mg/L	<0.001	0.5	Pass
Copper (Cu)	ICP-OES	mg/L	0.002	2.0	Pass
Zinc (Zn)	ICP-OES	mg/L	<0.001	5.0	Pass
Cadmium (Cds	AAS	mg/L	0.007	0.1	Pass
Mercury	AAS	mg/L	Not detected	0.001	pass
Lead	AAS	mg/L	<0.001	0.2	pass
Arsenic	AAS	mg/L	0.002	0.1	pass

Table 3: Bacteriological test result

BACTERIOLOGICAL TEST					
Parameters	**Method** Code	**Units**	**Laboratory** Results	**Standards** TZS 860:2006	**Remarks**
Total Coliform Organisms	MTRZWQL-ISO 9308-1	CFU/100mL	Not detected	10'	Pass
Faecal Coliforms	MTRZWQL-ISO 9308-2	CFU/100mL	Not detected	10'	pass

CONCLUSION

The results analyzed from Madimba gas plant wastewater samples at effluent point reveal tha! r wastewater treatment facility (Bioreactor treatment system) used in wastewater treatment helps to reduce high amount of organic matter, metals and nutrients. Also, due to the presence of Chlorination process helps to kill pathogens to make water safe.

RECOMMANDATION

According to the results above reveal that, the efficiency of wastewater treatment at Madimba gas plant is comply with TZS 860:2006 for tested parameters (physical-chemical, bacteriological and heavy metals). We advise regularly monitoring for further assurance.

Analyst

QC Officer

FOR: Laboratory Manager

MITCL
Modern Inspection & Testing Co. Ltd.

Our Ref : **MITCL/REP/0492**

Domicilium : **DAR-ES-SALAAM**

Date : **28TH FEBRUARY; 2023**

Gas Company (Tanzania) Limited
Plot No. 1 Block D, Kibaga Street
Kinyerezi Gas Receiving Station
P.O. Box 714
Dar es Salaam
Tanzania.

ATTN: GENERAL MANAGER.

Dear Sir,

RE: ANALYTICAL REPORT (PROVISION OF SAMPLE ANALYSIS FOR PORTABLE WATER AND WASTE WATER -SONGOSOSNGO GPP QUOTATION NO. PA/157/2022-23/N/28

Reference is kindly made to the above subject.

Please find attached herewith **Tax Invoice No. MITCL/INV 0492** for three (3) Portable water and waste water Samples Analysis with reference certificates no. **AGR**-COA/01/23/34, **AGR**-COA/01/23/35 and **AGR**-COA/01/23/36 from Songosongo Camp Site and Plant Site, sampled by us and submitted at our laboratory on 31st January; 2023 for analysis.

Sincerely yours,

Modern Inspection and Testing Company Limited

Anthony Kazembe

LABORATORY MANAGER.

Plot 318 - Block B, Chang'ombe B | P.O. Box 90505, Dar es Salaam - Tanzania
Mob: +255 757 400 003 | Email: mitcl2018@gmail.com | www.mitcltz.com

MITCL

Modern Inspection & Testing Co. Ltd.

CERTIFICATE OF ANALYSIS

Certificate Number	:	**AGR-COA/01/23/34**
Sample registration	:	01/23/37
Client	:	**GASCO COMPANY (TANZANIA) LIMITED** **PLOT NO.1 BLOCK D, KIBAGA STREET** **KINYEREZI GAS RECEIVING PLANT** **P. O. BOX 714** **DAR ES SALAAM, TANZANIA.**
Product	:	Portable water
Purpose of water	:	Domestic use
Installation/Source	:	Village
Sampling Point	:	Village tank Outlet
Sample type	:	Sampled sample
Date Sampled	:	31/01/2023 07:10hrs
Date received	:	31/01/2023 16:00hrs

TEST	METHOD	UNIT	** SPECS (TZS 789:2018)	RESULTS
pH	APHA 23rd Ed. 4500 H+B	-	5.5 – 9.5	7.06@26.5^{0}C
Electrical Conductivity	APHA 23rd Ed. 2510B	µS/cm	2500 Max.	1930.00
Total Dissolved Solids, TDS	APHA 23rd Ed. 2540C	mg/L	1500 Max.	997.00
Total Suspended Solids, TSS	APHA 23rd Ed. 2540D	mg/L	Not detectable	< 5*
Total Alkalinity as $CaCO_3$	APHA 23rd 2320 B	mg/L	-	18.00
Turbidity (NTU)	APHA 23rd Ed. 2017 2130B	NTU	25 Max.	<0.1
Free Chlorine	HACH 8021	mg/L	Absent	<0.21*
Total hardness, as $CaCO_3$	APHA 23rd Ed. 2340B	mg/L	600 Max.	26.3
Salinity	APHA 2520B	g/L	-	1.0
Chloride, Cl	APHA 23rd Ed.4110B	mg/L	250 Max.	536.820*
Magnesium, Mg	APHA 23rd Ed. 3120B	mg/L	100 Max.	5.22
Potassium, K	APHA 23rd Ed. 3120B	mg/L	50 Max.	18.47
Sulphate, SO_4	APHA 23rd Ed. 4110B	mg/L	400 Max.	15.320
Calcium, Ca	APHA 23rd Ed. 3120B	mg/L	150 Max.	1.94

Plot 318 - Block B, Chang'ombe B | P.O. Box 90505, Dar es Salaam - Tanzania
Mob: +255 757 400 003 | Email: mitcl2018@gmail.com | www.mitcltz.com

MITCL
Modern Inspection & Testing Co. Ltd.

Certificate Number :	AGR-COA/01/23/34

TEST	METHOD	UNIT	** SPECS (TZS 789:2018)	RESULTS
Zinc, Zn	APHA 23rd Ed. 3120B	mg/L	5 Max.	<0.05
Copper, Cu	APHA 23rd Ed. 3120B	mg/L	1.0 Max.	<0.05
Lead, Pb	APHA 23rd Ed. 3120B	mg/L	0.01 Max.	<0.01
Iron, Fe	APHA 23rd Ed. 3120B	mg/L	0.3 Max.	<0.05
Nickel, Ni	APHA 23rd Ed. 3120B	mg/L	0.02 Max	<0.01
Odour	Organoleptic	-	-	Unobjectionable
Physical Examination	Visual	-	-	Characteristics
Colour	APHA 23rd Ed. 2120C	Pt-Co	50 Max.	<5
Total Phosphates	APHA 23rd Ed. 4110B	mg/L	2.2 Max	<0.04
Total nitrogen	APHA 4500-N	mg/L	-	3.0
Nitrates, NO_3^-	APHA 23rd Ed. 4110B	mg/L	45 Max	2.44
Fecal Coliforms	APHA 9222D	cfu/100mL	Not detectable	Not detected
Total Coliforms	APHA 9222B	cfu/100mL	Not detectable	Not detected
Escherichia Coli	APHA 9222D & 9225	cfu/100mL	Not detectable	Not detected

Remarks:

- Above limit specifications*
- Tanzania Standard specification for portable water TZS 789:2018-EAS 12:2018 ICS: 67.060**

Signed by: _

Kazembe, Anthony
Authorized Signatory

Date of issue: 24/02/2023
Time issued : 15:00hrs

Plot 318 - Block B, Chang'ombe B | P.O. Box 90505, Dar es Salaam - Tanzania
Mob: +255 757 400 003 | Email: mitcl2018@gmail.com | www.mitcltz.com

MITCL
Modern Inspection & Testing Co. Ltd.

CERTIFICATE OF ANALYSIS

Certificate Number	:	**AGR-COA/01/23/35**
Sample registration	:	01/23/38
Client	:	**GASCO COMPANY (TANZANIA) LIMITED** **PLOT NO.1 BLOCK D, KIBAGA STREET** **KINYEREZI GAS RECEIVING PLANT** **P. O. BOX 714 DAR ES SALAAM, TANZANIA.**
Product	:	Waste Water
Installation/Source	:	Camp site
Sampling Point	:	Camp Tank outlet
Sample type	:	Sampled sample
Date Sampled	:	31/01/2023 07:31hrs
Date received	:	31/01/2023 16:00hrs

TEST	METHOD	UNIT	**SPECS (TZS 860:2019)	RESULTS
Aluminium as Al	APHA 23rd Ed. 2017 3120B	mg/L	2.0 Max.	<0.1
Arsenic as AS	APHA 23rd Ed. 3120B	mg/L	0.01 Max.	<0.01
BOD5 at 20^{0}C	APHA 23rd Ed. 5210B	mg/L	30 Max.	<7
Cadmium as Cd	APHA 23rd Ed. 3120B	mg/L	0.01 Max.	<0.01
Chlorides as Cl^-	APHA 23rd Ed. 4110B	mg/L	200 Max.	404.900*
Total Chromium	APHA 23rd Ed. 3120B	mg/L	1.0 Max.	<0.05
Chromium VI	APHA 23rd Ed. 3120B		0.05 Max.	<0.05
Cobalt as Co	APHA 23rd Ed. 3120B	mg/L	1.0 Max.	<0.01
COD	APHA 23rd Ed. 5220C	mg/L	60 Max.	12.1000
Colour	APHA 23rd Ed. 2120C	mgPt/L	50 Max.	< 5
Electrical Conductivity	APHA 23rd Ed. 2510B	µS/cm	-	1638.00
Lead as Pb	APHA 23rd Ed. 3120B	mg/L	0.01 Max	<0.01
Manganese as Mn	APHA 23rd Ed. 3120B	mg/L	5.0 Max.	<0.05
Mercury as Hg	EPA 200.7	mg/L	0.001 Max	<0.001
Nitrates as NO_3	APHA 23rd Ed. 4110B	mg/L	45 Max.	86.20*
Oil and Grease (emulsified)	APHA 23rd Ed. 5520B	mg/L	5 Max.	<5
pH	APHA 23rd Ed. 4500 H+B	mg/L	6.5-9.0	7.37@26.5^{0}C

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Certificate Number : AGR-COA/01/23/35

TEST	METHOD	UNIT	**SPECS (TZS 860:2019)	RESULTS
Sulphate as SO_4	APHA 23rd Ed. O4-2-E	mg/L	500 Max.	21.06
Temperature	APHA 2550 B	^0C	20-35	26.5
Total Kjeldahl Nitrogen(as N)	APHA 4500-N	mg/L	15 Max.	<1
Total Suspended solids	APHA 23rd Ed. 2540D	mg/L	100 Max.	<5
Turbidity	APHA 23rd Ed.2017 2130B	NTU	30NTU Max.	<0.1
Total Alkalinity as $CaCO_3$	APHA 23rd Ed. 2320B	mg/L	-	38.00
Cyanide	HACH 8027	mg/L	0.05 Max.	<0.005
Total Dissolved Solids	APHA 23rd Ed. 2540C	mg/L	1200 Max.	844.00
Silicates	APHA 23rd Ed. 3120B	mg/L	-	<0.1
Total Phosphates	APHA 23rd Ed. 4110B	mg/L	5 Max.	8.05*
Ammonium Nitrogen	APHA 23rd Ed. 2017 4500 NH C	mg/L	5 Max.	<0.1
Total Nitrogen	APHA 4500-N	%	10 Max.	88.0*
Dissolved Oxygen	APHA 23rd Ed. 4500 O C	mg/L	-	7.6
Sludge index	Calculation	-	-	<0.1
Fluorides as F^-	APHA 23rd Ed. 4110B	mg/L	4 Max.	< 0.04
Salinity	APHA 2520B	g/L	-	0.7
Total Coliforms organisms	APHA 9222B	cfu/100mL	10,000 Max.	Not detected

Remarks:

- Above limit specifications*
- Tanzania Standard General tolerance for Municipal and Industrial waste water TZS 860:2019 ICS: 13.060.30**

Signed by: _

Kazembe, Anthony
Authorized Signatory

Date of issue: 24/02/2023
Time issued : 15:00hrs

"This report has been reviewed for accuracy, completeness, and comparison against specifications when available. The reported results are only representative of the sample submitted for testing. This report shall not be reproduced except in full without written approval of the laboratory."

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CERTIFICATE OF ANALYSIS

Certificate Number	:	**AGR-COA/01/23/36**
Sample registration	:	01/23/39
Client	:	**GASCO COMPANY (TANZANIA) LIMITED** **PLOT NO.1 BLOCK D, KIBAGA STREET** **KINYEREZI GAS RECEIVING PLANT** **P. O. BOX 714** **DAR ES SALAAM, TANZANIA.**
Product	:	Portable water
Purpose of water	:	Domestic and industrial use
Installation/Source	:	Plant site
Sampling Point	:	Plant Tank Outlet
Sample type	:	Sampled sample
Date Sampled	:	31/01/2023 08:10hrs
Date received	:	31/01/2023 16:00hrs

TEST	METHOD	UNIT	** SPECS (TZS 789:2018)	RESULTS
pH	APHA 23rd Ed. 4500 H+B	-	5.5 – 9.5	7.11@26.5^{0}C
Electrical Conductivity	APHA 23rd Ed. 2510B	µS/cm	2500 Max.	1892.00
Total Dissolved Solids, TDS	APHA 23rd Ed. 2540C	mg/L	1500 Max.	992.00
Total Suspended Solids, TSS	APHA 23rd Ed. 2540D	mg/L	Not detectable	<5*
Total Alkalinity as $CaCO_3$	APHA 23rd Ed.2320 B	mg/L	-	20.00
Turbidity (NTU)	APHA 23rd Ed. 2017 2130B	NTU	25 Max.	<0.1
Free Chlorine	HACH 8021	mg/L	Absent	0.22*
Total hardness, as $CaCO_3$	APHA 23rd Ed. 2340B	mg/L	600 Max.	24.6
Salinity	APHA 2520B	g/L	-	1.0
Chloride, Cl	APHA 23rd Ed.4500 Cl-B	mg/L	250 Max.	584.500*
Magnesium, Mg	APHA 23rd Ed. 3120B	mg/L	100 Max.	5.01
Potassium, K	APHA 23rd Ed. 3120B	mg/L	50 Max.	18.65
Sulphate, SO_4	APHA 23rd Ed. 4110B	mg/L	400 Max.	15.110
Calcium, Ca	APHA 23rd Ed. 3120B	mg/L	150 Max.	1.60

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Certificate Number :	AGR-COA/01/23/36

TEST	METHOD	UNIT	** SPECS (TZS 789:2018)	RESULTS
Zinc, Zn	APHA 23rd Ed. 3120B	mg/L	5 Max.	<0.05
Copper, Cu	APHA 23rd Ed. 3120B	mg/L	1.0 Max.	<0.05
Lead, Pb	APHA 23rd Ed. 3120B	mg/L	0.01 Max.	<0.01
Iron, Fe	APHA 23rd Ed. 3120B	mg/L	0.3 Max.	<0.05
Nickel, Ni	APHA 23rd Ed. 3120B	mg/L	0.02 Max	<0.01
Odour	Organoleptic	-	-	Unobjectionable
Physical Examination	visual	-	-	Characteristics
Colour	APHA 23rd Ed. 2120C	Pt-Co	50 Max.	<5
Phosphates	APHA 23rd Ed. 4110B	mg/L	2.2 Max	4.54*
Total nitrogen	APHA 4500-N	mg/L	-	3.2
Nitrates, NO_3^-	APHA 23rd Ed. 3120B	mg/L	45 Max	2.47
Fecal Coliforms	APHA 9222D	cfu/100mL	Not detectable	Not detected
Total Coliforms	APHA 9222B	cfu/100mL	Not detectable	Not detected
Escherichia Coli	APHA 9222D & 9225	cfu/100mL	Not detectable	Not detected

Remarks:

- Above limit specifications*
- Tanzania Standard specification for portable water TZS 789:2018-EAS 12:2018 ICS: 67.060**

Signed by: _

Kazembe, Anthony
Authorized Signatory

Date of issue: 24/02/2023
Time issued : 15:00hrs

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Appendix 10: **Noise Monitoring Report**

GAS COMPANY (T) LIMITED
SONGOSONGO GAS PROCESSING PLANT

NOISE MONITORING RECORD

GASCO

Observer: Valerian Mella **Date / Time:** 7th March 2023 1100am

LOCATION	CONDITION AT TIME OF SURVEY	NOISE LEVEL (DB) Max	NOISE LEVEL (DB) Min	COMMENTS
GE 1 - 3m from exhaust stack		67.9	63.5	Engine off.
GE 2 - 3m from exhaust stack		70.5	67.9	Engine off
GE 3 - 3m from exhaust stack		75.9	74.1	Engine off
GE 4 - 3m from exhaust stack	Engine in Operation	78.2	74.8	Engine on
Diesel Fire Engine area		87.0	66.5	All Engines off
Air & Nitrogen compressor		84.9	78.1	
RO Unit – Inside containers	ROA Running	92.2	90.7	R.OB – 68.5 – 61.3
RO Unit – Outside containers		78.0	74.3	
Propane DD1		90.1	88.3	Running
Propane DD2		65.9	62.1	Not Running
Export Compressor Area	Compressor C Running	82.5	78.4	Comp A - 73.9 – 71.2 – off Comp B – 77.3 – 74.9 – off
Cooler Fans Export compressor	Gas Cooler fan C Running	90.5	89.8	Gas cooler – A 78.9 – 77 – off Gas cooler – B 84.8 – 82.8 – off
Warehouse		52.6	49.0	

NOISE LEVEL (in dB)	RISK FACTOR
0 to 82	Insignificant risk of noise induced hearing loss. No action required in this category
83 to 85	Potential risk of noise induced hearing loss. Continuous monitoring of exposure levels. Personnel to wear HPD (Earplugs)
86 to 90	Moderate risk of noise induced hearing loss. Intervention required. HPD should be worn (Ear Muffs)
91 to 95	Significant risk. Priority intervention required
96 to 105	Unacceptable risk. Immediate intervention required
More than 106	Extreme risk, urgent intervention and on-going re-evaluation of the risk required

Tanzanian Sound Level Limits (dBA) TZS 932: 2007	Daytime (06:00-22:00 hrs.)- higher Limit 70 dB	Night Time (22:00 -06:00hrs) – higher Limit 60 dB

GAS COMPANY (T) LIMITED
SONGOSONGO GAS PROCESSING PLANT

GASCO

ILLUMINATION MONITORING RECORDS

Observer: Valerian Mella

Date : 28/06/2023 : 10:38

LOCATION	WEATHER CONDITION AT TIME OF SURVEY	Illumination level DAYTIME Time: 10:38		NIGHTTIME TIME: 2000hrs		COMMENTS
		Max	Min	Max	Min	
Printing Room : Mechanical Desk		144	142	116	115	
Printing Room : LSO Desk		102	156	114	112	
Printing Room : HSE Desk		99	95	130	125	
CCR – Export compressor		590	490	340	298	
CCR – Main DCS		590	568	531	528	
Engineering Room Electrical Desk		248	232	177	176	
Engineering Room Instrument Desk		242	221	176	161	
Engineering Room SS Desk		187	179	132	125	
Boardroom		245	243			
Superintendent's office		417	407			
Plant Manager's Office		380	368			
Staff office: IT Desk		424	416	255	253	
Staff office: WT Desk		259	238	144	134	
Staff office: MT Desk		368	357	277	274	
Staff office: ET Desk		269	260	130	128	
Staff office: MT Desk		304	303	083	75	
Staff office: PG Desk		165	160	125	124	

Standard used	Lower- Upper Limit (Lux)	Effect of non-conformance
ILO Standards	200 -1000 Lux	Eye strain / Vision loss Fatigue Poor work performance

Lab 1 – Finish. 103 / 103 | Lab 4 166 136

– 082 43 | 354 318

– 78 77 | 398 377.

TPDC		Tanzania Petroleum Development Corporation Madimba Natural Gas Processing Plant	GASCO	
Document No.	**Rev**	**Document Title**	**First issued**	**Last revised**
MAD/HSE/FRM/018/-02	1	NOISE GENERATION SURVEY	07/10/2018	10/10/2020

DATE: 27th June2023

S/N	LOCATION	MAXIMUM LIMIT STANDARD (DB)	RESULTS (DB)	REMARKS	STATUS OF EQUIPMENT (Running/Idle)	EXISTING CONTROL
1.	Reception facility	85	61.5	Acceptable	Running	
2.	Fuel skid	85	94.8	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
3.	Condensate stabilization unit	85	69.4	Acceptable	Idle	
4.	MEG pump DD1	85	80.2	Acceptable	Running	
5.	Condenser fan DD1	85	94.1	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
6.	Propane motor – DD1	85	91.3	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
7.	MEG pump DD2	85	79.4	Acceptable	Idle	
8.	Condenser fan DD2	85	66.8	Acceptable	Idle	
9.	Propane motor – DD2	85	69.9	Acceptable	Idle	
10.	MEG pump DD3	85	79.5	Acceptable	Running	
11.	Condenser fan DD3	85	90.1	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear

						plug/muffs when working in this area
12.	Propane motor – DD3	85	90.6	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
13.	Flare unit area	85	59.1	Acceptable	Running	
14.	Knock out drum	85	60.9	Acceptable	Running	
15.	Gas Engines 1	85	78.4	Acceptable	Idle	
16.	Gas Engines 2	85	80.9	Acceptable	Idle	
17.	Gas Engines 3	85	108.7	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
18.	Fuel station at gas engine	85	64.3	Acceptable	Running	
19.	Emergency diesel generator	85	66.0	Acceptable	Idle	
20.	Air and Nitrogen station (when compressor unload& unloading)	85	90.3	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
21.	Air and Nitrogen station (when air flashed out of drier)	85	120.5	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area
22.	Fire engine A	85	60.5	Acceptable	Idle	
23.	Fire engine B	85	64.1	Acceptable	Idle	
24.	Jockey pump	85	55.3	Acceptable	Idle	

25.	Desalinated water pump	85	79.2	Acceptable	Running (Pump A)	
26.	Raw water pumps	85	79.5	Acceptable	Idle	
27.	Process waste water plant	85	83.0	Acceptable	Running (GEM)	
28.	Diesel generator A	85	50.1	Acceptable	Idle	
29.	Diesel generator B	85	54.9	Acceptable	Idle	
30.	STP Air blowers	85	93.8	Above limit	Running	Reduce exposure time, frequency and/ or Wear ear plug/muffs when working in this area

Comments:

1. In areas with high noise, staffs and site personnel are advised to reduce exposure time, frequency and use ear muffs/ear plugs

Conducted by: _____

Appendix 11: **Light/illumination Monitoring**

TPDC	Tanzania Petroleum Development Corporation Madimba Natural Gas Processing Plant		GASCO	
Document No.	**Rev**	**Document Title**	**First issued**	**Last revised**
MAD/HSE/FRM/018/-01	1	LIGHTING SURVEY	07/10/2018	10/10/202

DATE: 30 June 2023

1. PLANT AREAS

S/N	Location	Specifications (Lux)	Inspection results (Lux)	Remarks
1.	Plant manager office	200-1500	712	Acceptable
2.	Plant superintendent office	200-1500	884	Acceptable
3.	CCR	200-1500	769	Acceptable
4.	Engineering room - Electrical sup desk	200-1500	301	Acceptable
5.	Engineering room – HSE desk	200-1500	250	Acceptable
6.	Engineering room - Mechanical sup desk	200-1500	358	Acceptable
7.	Engineering room - Instrument sup desk	200-1500	261	Acceptable
8.	Engineering room – Logistic desk	200-1500	397	Acceptable
9.	Printer room – Lab tech desk	200-1500	210	Acceptable
10.	Printer room – Water tech desk	200-1500	225	Acceptable
11.	Printer room- Electrical tech desk	200-1500	402	Acceptable
12.	Printer room – shift sup desk	200-1500	413	Acceptable
13.	Instrument room	200-1500	552	Acceptable
14.	Corridor	150-750	501	Acceptable
15.	Plant Boardroom	200-1500	350	Acceptable
16.	Laboratory 1	200-1500	566	Acceptable
17.	Laboratory 2	200-1500	303	Acceptable
18.	Laboratory 3	200-1500	533	Acceptable
19.	Toilet for Gents	200-1500	289	Acceptable
20.	Toilet for Ladies	200-1500	291	Acceptable
21.	Tea room	200-1500	210	Acceptable

22.	Guard house A	200-1500	520	Acceptable
23.	Guard house B	200-1500	489	Acceptable
24.	Gas engines container 1	200- 1500	323	Acceptable
25.	Gas engine container 2	200- 1500	471	Acceptable
26.	Gas engine container 3	200- 1500	297	Acceptable
27.	Electrical house	200- 1500	388	Acceptable
28.	Electrical control room	200-1500	390	Acceptable
29.	Switching cabinet room (11KV)	200-1500	391	Acceptable
30.	RO container 1	200- 1500	396	Acceptable
31.	RO container 2	200- 1500	441	Acceptable
32.	RO container 3	200- 1500	453	Acceptable
33.	RO container 4	200- 1500	501	Acceptable
34.	Oily water separation package container	200- 1500	344	Acceptable
35.	AOP container	200- 1500	341	Acceptable
36.	Sludge drying package container	200- 1500	298	Acceptable
37.	Warehouse	200- 1500	506	Acceptable
38.	Spare parts container 1	200- 1500	294	Acceptable
39.	Spare parts container 2	200- 1500	321	Acceptable
40.	Spare parts container 3	200- 1500	362	Acceptable
41.	Spare parts container 4	200- 1500	509	Acceptable

2. CAMPSITE

S/N	Location	Specifications (Lux)	Results (Lux)	Remarks
1.	Camp guard house	200-1500	443	Acceptable
2.	Logistic office	200-1500	351	Acceptable
3.	Security office	200-1500	303	Acceptable
4.	Camp CCR	200-1500	419	Acceptable
5.	Stationery storage room	200-1500	289	Acceptable
6.	Board room	200-1500	307	Acceptable
7.	Administration office toilet - Gents	200-1500	400	Acceptable

8.	Administration office toilet - Ladies	200-1500	397	Acceptable
9.	GYM room	200-1500	599	Acceptable
10.	Meditation room	200-1500	214	Acceptable
11.	Clinic room	200-1500	331	Acceptable
12.	Patient rest room	200-1500	322	Acceptable
13.	Camp server room	200-1500	298	Acceptable
14.	Library	200-1500	548	Acceptable
15.	RO room	200-1500	399	Acceptable
16.	STP pump house	200-1500	441	Acceptable
17.	Dinning	200-1500	654	Acceptable
18.	Dish wash room	200-1500	316	Acceptable
19.	Food storage room 1	200-1500	354	Acceptable
20.	Food storage room 2	200-1500	278	Acceptable
21.	Kitchen	200-1500	511	Acceptable
22.	Laundry room	200-1500	456	Acceptable
23.	Canteen toilet - Gents	200-1500	298	Acceptable
24.	Canteen toilet - Ladies	200-1500	304	Acceptable

Comments: Illumination was within acceptable range.

Conducted by: LUCAS NDAGA 29/06/2023

Appendix 12: **Waste Monitoring**

Date	Paper Waste	Plastic Waste	Scrape Metal	Used oil	Filters	Used Batteriess	Food waste	Other waste
	Quantities in (Kg)							
01-Jan-23	0.95	1.3	0	0	0	0	21.95	5.8
02-Jan-23	3.09	2	0	0	0	0	14.95	3.8
03-Jan-23	2.9	1.75	0	0	0	0	22.9	2.85
04-Jan-23	0	0	0	0	0	0	20.12	3.45
05-Jan-23	1.5	2.15	0	0	0	0	22.07	3.95
06-Jan-23	8.1	4.37	0	0	0	0	20.34	3.74
07-Jan-23	3.68	5.82	0	0	0	0	17.17	2.9
08-Jan-23	4.54	1.22	0	0	0	0	22	4.02
09-Jan-23	0	0	0	0	0	0	19.85	2.45
10-Jan-23	2.3	2.35	0	0	0	0	21.91	4.17
11-Jan-23	0	0	0	0	0	0	23.94	4.64
12-Jan-23	1.03	1.24	0	0	0	0	22.34	3.17
13-Jan-23	1.32	1.18	0	0	0	0	19.79	4.02
14-Jan-23	2.04	1.3	0	0	0	0	17.1	2.29
15-Jan-23	1.2	1.08	0	0	0	0	13	2.47
16-Jan-23	1.18	1.01	0	0	0	0	21.35	4.05
17-Jan-23	1.38	1.12	0	0	0	0	10.4	3.98
18-Jan-23	1.51	1.2	0	0	0	0	19.2	2.65
19-Jan-23	1.24	1.16	0	0	0	0	23.5	3.3
20-Jan-23	1.86	1.3	0	0	0	0	25.3	3.45
21-Jan-23	1.2	1.12	0	0	0	0	16.65	3.12
22-Jan-23	1.12	1.06	0	0	0	0	11.28	3.15
23-Jan-23	1.32	1.18	0	0	0	0	21.14	4
24-Jan-23	2.1	1.88	0	0	0	0	22.07	3
25-Jan-23	1.3	1.18	0	0	0	0	17.35	2.4
26-Jan-23	4.9	1.9	0	0	0	0	12.85	2
27-Jan-23	3.1	1.08	0	0	0	0	10.7	2.35
28-Jan-23	1.11	1.3	0	0	0	0	11.1	3.1
29-Jan-23	1.02	1.22	0	0	0	0	8.4	2.5
30-Jan-23	1.2	1.46	0	0	0	0	17.4	3.95
31-Jan-23	1.28	1.32	0	0	0	0	20	4.14
Total	***59.47***	***46.25***	***0***	***0***	***0***	***0***	***568.12***	***104.86***

Appendix 13: **Municipal Waste Disposal Permit**

JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS

TAWALA ZA MIKOA NA SERIKALI ZA MITAA

HALMASHAURI YA WILAYA YA KILWA

Unapojibutafadhalitaja:

Kumb.Na KDC/. M.10/VOL II/166 24/05/2022

GIFRIMA INVESTMENT COMPANY.
S.L.P 22158
DAR ES SALAAM.

YAH: MAOMBI YA KIBALI CHA KUTOA TAKA KUTOKA KIWANDA CHA TPDC SONGOSONGO NA KUPELEKA ENEO LA KUTUPIA DAMPO KITONGOJI CHA MPARA.

Rejea kichwa cha habari cha barua hii.

Halmashauri ya wilaya ya kilwa imepokea barua yako yenye mada tajwa hapo juu hivyo basi Halmashauri imekupata ruhusa ya kutupa takataka zisizo hatarishi eneo lililotengwa dampo katika kitongoji cha mpara mamlaka yamji mdogo Masoko kutoka kata ya Songosongo kwenye kiwanda cha **TPDC.**

Kwa kuzingatia kifungu cha 117 cha Sheria ya Usimamiziwa Mazingira ya Mwaka 2004. Aidha fahamu kuwa kutupa taka eneo tofauti na lililotengwa ni kwenda kinyume nataratibu zilizowekwa, kwa kufanya hivyo hatua kali za kisheria zitachukuliwa dhidi yako.

Ni matumaini yangu utazingatia sheria ili kuepusha madhara yeyote ambayo yanaweza kujitokeza.

Asante.

Boniface Achiula
Afisa Mazingira naUthibitiwa Taka Ngu

NAKALA; Mtendaji Kata Songosongo (*Aione kwenye Jalada*)
Mtendaji wa kijiji songosongo (aione kwenye jalada)

Appendix 14: **Health Safety and Environmental Policy**

	GAS COMPANY TANZANIA LIMITED (GASCO)	QUALITY POLICY	PROCEDURE NUMBER : Q-P-001 REVISION NUMBER : A DATE : 30-09-2019

GASCO QUALITY POLICY STATEMENT

GAS Company (Tanzania) Limited (GASCO) deals with natural gas processing, transportation and distribution that is committed to providing products and services that consistently meet customers specified contractual and project requirements. We are dedicated to meeting quality standards that ensure that the needs, requirements and expectations of our customers and stakeholders are exceeded.

The Management of GASCO recognizes that in the pursuit of our objectives, we must obtain and develop the cooperation and involvement of all of our Employees, Contractors and Customers and Government at large in order to harness the experience and expertise available to us and thus develop a system which has full commitment by all relevant parties.

In accordance with GASCO's general aims and strategies for growth, Management promotes:

- The central role of the customer;
- Continuous improvement in the quality of products and services, especially through a strong drive toward technological innovation in achieving products and services of the highest practicable quality that meet the requirements of our customers;
- Full involvement of all personnel to ensure complete awareness of the significance and importance of their work and how they can contribute to achieving quality;
- Constant monitoring of quality performance and implement improvements when appropriate for continuous improvement in process performance; and
- Effective organization wide communication of the importance of meeting client needs, legal requirements and complying with all National and relevant international legislation and regulations related to its business activities.

Compliance with this Policy is primarily the responsibility of Management, which is committed to promoting understanding and dissemination of the Policy to all employees and interested parties and it is monitored and reviewed periodically and updated as required to ensure it continued suitability.

Eng. Baltazari Thomas Mrosso
Ag. General Manager GASCO

30/09/2019
Date

Appendix 15: **Waste Water Discharge Permit**

Form F

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

RUVUMA AND SOUTHERN COAST BASIN WATER BOARD (RSCBWB)

PROVISIONAL GRANT OF A DISCHARGE PERMIT

The Water Resources Management Act. No. 11 of 2009

(Section 63)

Discharge Permit No. **RSCBWB / PDP 41200954/ 2022** District: **MTWARA RURAL**

Zone/ Catchment: **LOWER RUVUMA** Region: **MTWARA**

1. Name of Holder: **GAS COMPANY (T) LIMITED**
2. Address: **P.O. BOX 714, DAR-ES-SALAAM.**
3. Particulars of Discharge Permit: **To Discharge 50m³/d of Wastewater from Sewage System and Gas Processing Plant All After Treatment Processes.**
4. This Provisional Discharge Permit is: **Personal to the Grantee and may not be transferred Without the Consent of the Basin Water Director.**
5. Works Required: **Constructed.**
6. Whether grant is subject to construction of works specified in paragraph 5 and date by which works to be completed: **The Required Wastewater Treatment System Already Exist**
7. This Provisional Discharge Permit is granted subject to the provisions of the Water Resources Management Act No.11 of 2009 and the Special Terms and Conditions Specified Overleaf.

MKURUGENZI
BONDE LA RUVUMA NA PWANI YA KUSINI
S.L.P. 931 MTWARA

Date; 25th November, 2022

Jumanne S. Mpemba
Basin Water Director