

REPUBLIC OF RWANDA



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**REGULATIONS ON DECENTRALIZED WASTEWATER TREATMENT
SYSTEMS**

ISSUED BY

REGULATORY BOARD

RWANDA UTILITIES REGULATORY AGENCY – (RURA)

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REGULATIONS N° .../SAN-RURA/2012 OF/.../2012 ON DECENTRALIZED WASTEWATER TREATMENT SYSTEMS

Preamble:

The Regulatory Board of the Rwanda Utilities Regulatory Agency (RURA) in its meeting of .../.../2012,

Considering the Organic Law no 04/2005 of 08/04/2005 determining the modalities of protection, conservation and promotion of the environment in Rwanda especially in its articles 18, 32 and 47;

Pursuant to Law n° 39/2001 of 13 September 2001 establishing the Rwanda Utilities Regulatory Agency (RURA) , in its articles 1 ,5 13 and 35;

Pursuant to Law n°62/2008 of 10/09/2008 putting in place the use, conservation, protection and management of water resources especially in its articles 58, 59 and 60;

Given the Ministerial Order n°4/DC/04 of 07/06/2004 on annual fees payable by public utilities especially in its article 3;

Considering the effluent standards as set by the Rwanda Bureau of Standards,

Considering the need of having regulatory tools so as to improve the delivery of sanitation services in terms of designing, installing, operating and maintaining decentralized sewage treatment systems;

And after its deliberations in its meeting of;

HEREBY ISSUES THE FOLLOWING REGULATIONS:

CHAPTER ONE: GENERAL PROVISIONS

Article one: Objective

These regulations aim at providing regulatory framework for activities of designing, installing, operating and maintaining decentralized sewage treatment systems to ensure compliance with environmental laws, rules and regulations and to ensure reliability, accessibility and affordability of service in fair competition.

Article 2: Scope

These regulations are applied to all activities relating to design, installation, operation and maintenance of decentralized wastewater treatment systems including the wastewater treatment plants and other wastewater treatment facilities that discharge to the environment and water bodies as means of effluent disposal.

Article 3: Definition of terms

For the purpose of these regulations, the following words and terms shall have the following meanings:

- a) **“Decentralized wastewater treatment systems”** means a collection, treatment and disposal of wastewater from individual homes, clusters of homes (Estate), isolated communities, or institutional facilities as well as from existing communities. These systems treat and dispose off effluent at or near their origin.
- b) **“De-sludging”** refers to the removal of sludge and is crucial to the continued correct and satisfactory performance of sewage treatment plants.
- c) **“Domestic wastewater”** means the wastewater coming from residential sources including toilets, sinks, bathing, and laundry.
- d) **“Effluent”** means the liquid discharged from a treatment unit.
- e) **“Installer”** means a person/company that constructs or repairs sewage treatment systems.
- f) **“License”** means an official document which confirms that the identified person/company can legally operate that type of facility within the country.
- g) **“Owner”** means any individual, any group of individuals acting individually or as a group, any public or private institution, corporation, company, partnership, firm or association, federal agencies having the authority to construct, maintain, operate, repair, improve or extend sewage treatment works. The tenant shall also be considered as the owner.
- h) **“Operator”** means any individual employed or appointed by any owner, and who is designated by such owner to be responsible and whose duties include the control of the treatment works operations.
- i) **“Qualified service provider”** means Service provider licensed by RURA
- j) **“Regulator”** means Rwanda Utility Regulatory Agency (RURA)
- k) **“Service provider”** means natural persons, enterprises or organizations which provide wastewater treatment related services in terms of design, installation, operation and maintenance.
- l) **“Sewage”** means the water-carried and human excrement, kitchen, laundry, shower, bath or lavatory wastes, separately or together with such underground, surface, storm and other water and liquid industrial wastes as may be present from residences, buildings, vehicles, industrial establishments or other places. It refers to the wastewater released by residences, businesses and industries in a community.

- m) **“Sewage sludge”** or **“sludge”** means any solid, semisolid, or liquid residues which contain materials removed from municipal or domestic wastewater during treatment.
- n) **“Sewage treatment”** means the process of removing contaminants from wastewater and household sewage, both runoff (effluents) and domestic aimed at producing waste stream (or treated effluent) and solid waste or sludge suitable for discharge or reuse back into the environment. It includes physical, chemical, and biological processes to remove physical, chemical and biological contaminants. .
- o) **“Sewerage system”** means a sewage collection system consisting of pipelines or conduits, pumping stations and force mains and all other construction, devices and appliances appurtenant thereto, used for the collection and conveyance of sewage to a treatment works or point of ultimate disposal.
- p) **“System Designer”** means a person who investigates soils and site characteristics to determine suitability, limitations and sizing requirements and designs sewage treatment systems.
- q) **“Users”** means a person, organization, or other entity, that uses the sewage treatment facilities.
- r) **“Wastewater”** means the water that has been used including any human excrete or domestic waterborne waste, whether untreated or partially treated and it contains various pollutants, depending on what it was used for.
- s) **“Wastewater treatment”** means a process to improve and purify the water, removing some or all of the contaminants, making it fit for reuse or discharge back to the environment

CHAPTER 2: LICENCE REQUIREMENT FOR SYSTEM INSTALLATION ACTIVITIES

Article 4: License Requirements for installation of decentralized wastewater treatment systems

(i) Any activity relating to installation of a sewage treatment system shall be subject to a license issued by the Regulatory Agency thereof.

(ii) Application for license shall be addressed to the Director General of RURA and the application shall be accompanied by a prescribed fee, and shall specify the following:

- (1) The name of the company;
- (2) The Company registration Certificate;
- (3) The shareholders in the company or the owners;
- (4) The names and qualifications of the senior staff of service provider;

- (5) The type of service to be provided;
- (6) The business plan for at least 5 years highlighting among others:
 - a) plans for the provision of an efficient, affordable and sustainable wastewater treatment service;
 - b) performance targets; financial and infrastructural improvements and
 - c) any other details as the Regulator may prescribe

Article 5: Validity of license

A license for installation of decentralized wastewater treatment systems shall be granted for a period of at least two years renewable provided that the licensee complies with applicable rules and regulations and license conditions.

Article 6: Regulatory fees

Fees to be levied by the Regulatory Authority for installation, services of wastewater systems are as follows:

- (i) For license applications, whether or not the application is successful: RWF 5,000
- (ii) License Fee payable upon the grant of license: Rwf 250,000.
- (iii) Annual regulatory fees payable by Public utilities of 1% of annual turnover for the contribution to the functioning of the Regulatory Authority as fixed by the Ministerial Order No 4/DC/04 of 07/06/2004

Article 7: Requirements for Management by Owners of Wastewater Treatment Facilities

(i) Owners of wastewater Treatment facilities will register with the regulator. Application for registration will precise the capacity of the system installed, the contact address and name, and qualifications of each operator employed at such facility. The application for registration will be subject to a registration fee of 50,000 Rwandan Francs.

(ii) The owner of a wastewater treatment facility shall notify the Regulator in writing prior to any additions or deletions of unit processes or unit operations of the system as well as system failure.

(iii) If the Owner of a system fails to operate it to the required standards, He/she will be compelled to sub contract to a licensed company.

(iv) The Regulator has full rights to audit and inspect the wastewater treatment and impose any change for the proper operation of the facility in relation to the protection of public health.

CHAPTER 3: COMPETITION AND SOCIAL ECONOMIC OBLIGATIONS

Article 8: Adequate means to finance the activities

The license applicant is required to show his or her capacity, both financial and technical, to provide service to all customers, in a reliable and sustainable manner.

Article 9: Anti –competitive behavior or practice

Installers of decentralized wastewater facilities are not allowed to adopt any anti competitive behavior or practice which might be prejudicial to the interests of customers, or other competitors

Article 10: accessibility, fairness and affordability

The installer should provide service with fairness to service subscribers at reasonable conditions of accessibility and affordability.

Article 11: Financial and Accounting records

The licensee shall maintain all financial and accounting records and submit the financial statements not later than 31 March of each year.

Article 12: Report on the business plan implementation

The licensee shall submit to the regulator periodical reports on the business plan implementation as may be required.

CHAPTER 4: TECHNICAL REQUIREMENTS FOR INSTALLATION OF WASTEWATER TREATMENT SYSTEM

Article 13: Pre-design investigations

Sewage treatment system designs shall require feasibility or pre-design investigations. These shall include an Environmental Impact Assessment (EIA), feasibility studies and other special services.

The pre-design investigations shall also take into consideration among others:

- (1) Soils investigation: A soil morphology test is to be taken to determine if the site is suitable for a sewage treatment system. These examinations shall look at percolation, soil permeability and general soil properties.
- (2) Flood Protection: The susceptibility of the site to flooding should be investigated.
- (3) The designer should also consider if high receiving water levels would impact the discharge of treated sewage effluent and should show the plan of separation of wastewater from storm water.

- (4) The feasibility studies shall provide alternatives in terms of capital, operation and maintenance costs, land requirements, operating efficiency and energy conservation obtained from topographic plans or photogrammetric mapping and the system drawings.

Article 14: Requirements for design of sewage treatment systems

The design of sewage treatment systems shall meet the required effluent quality objectives, sludge disposal requirements and minimum treatment technology. More particularly, the designer of sewage treatment systems shall take into consideration the following:

- (1) Differentiation of wastewater from residential, commercial and industrial sites prior to design and establishment of loading rates. In no case shall commercial plant be designed with loading less than that of a residential project. Pretreatment of wastewater may be a consideration;
- (2) Sensitivity to fluctuating daily flows and peak hourly flows;
- (3) The number of people to be served, waste characteristics of the wastewater and any special conditions affecting the design;
- (4) Site particulars, including the distance to nearest residential area or public place, water authority sewer and access for maintenance vehicles, occupied buildings, swimming pools, Individual water supply, Streams, watercourses, lakes, ponds, delineated wetlands or other surface. Where conditions warrant, greater isolation distances may be required;
- (5) The possibility of future extensions, duplication of the system and ease of treatment plant removal;
- (6) New connections to an existing system must be planned, designed and constructed to prevent as far as practicable the potential for overflows from both the new and existing systems. This is particularly relevant in areas with significant urban growth;
- (7) A properly sized exterior grease trap is required for pretreatment of kitchen waste from a restaurant or any other commercial kitchen where sewage treatment systems are used;
- (8) Alarms are mandatory for mechanical equipment, such as aerobic treatment units, pumps and others to alert the responsible individual in the event of malfunction;
- (9) For the positioning of the discharge point for the treated wastewater, the system should preferably be installed in ground falling away from the house so that the treated wastewater drains away from the house and if possible from regularly used parts of the garden;
- (10) The minimum degree of treatment to be provided shall be adequate in design to produce an effluent in accordance with the available national effluent disposal standards or effluent limitations adopted. The tolerance limits which are applied to the physical, chemical and microbiological domestic wastewater discharged from residential houses, business buildings, institutions; etc shall comply with effluent standards as set by competent authority.
- (11) The owner of the system provides the installer/designer with accurate information concerning the use and capacity of the building necessary for design and installation to avoid the system failure.

Article 15: System location

Sewage treatment systems should be located as follows:

- (1) Sewage treatment system sites must be located as far as practicable from any existing commercial or residential area, dwellings, water supply sources, cisterns, springs, basements, swimming pools and streams or any area that will probably be developed within the system's design life.
- (2) Sewage treatment systems must be so positioned that it is not subject to flooding or is otherwise protected from flooding and has all weather road access. They must not be located:
 - i. In a flood plain where the groundwater level is high or where surface water flooding is a possibility.
 - ii. Where soil has been mapped or identified as floodplain soil or a floodprone area where the groundwater level is high or where surface water flooding is a possibility.
 - iii. where the area has been delineated as a wetland
 - iv. Storm water channels should be separated from wastewater channels
- (3) Should be located where no offensive odours are detected. The system will require venting and the vent should preferably be out of sight and downwind from the house or occupied buildings to minimize the possibility of odour problems
- (4) Site the system to minimize the impact of any noise from an integral motor or pump

Article16: Installation of sewage treatment system

Installation of Sewage treatment system is subject to the following conditions:

- (1) Installation of sewage treatment systems must be governed by a written contract and be performed by a competent person/company to ensure that the treatment units are constructed in accordance with the manufacturer's recommendations and regulations.
- (2) The installer shall review the design if done by a third party and suggest any relevant improvement; afterwards he/she will be responsible for any default.
- (3) The system installer shall provide detailed operating and installation instructions and an "Operation and Maintenance Manual" with all necessary information on the type of system installed together with all operating instructions of that particular system.
- (4) The system installer shall provide the services of a owner's technician for a minimum period of one month to perform initial start-up of the system, to instruct the owner's operating personnel in the operation and maintenance of the system and to adjust the equipment for satisfactory operation after installation.
- (5) The installer shall be liable for the system failure that may be caused by poor installation during the period of guarantee

Article17: Acceptance of Installation works

Upon completion of installation works, the installer must notify to the operator/owner the date at which the system is ready for provisional reception and must perform pre-reception tests in the

presence of the operator /owner. The provisional reception will be documented by a report outlining any default that needs to be redressed and relevant timeframe.

The installer:

- (i) Must give a minimum period of one year guarantee to the operator/owner.
- (ii) Shall provide and post up the drawings of the system on the location site;
- (iii) Shall also provide the owner with the procedure manual; the maintenance manual, initial stocks consumable and maintenance spares.

Article 18: Performance Bond

The installer/system provider shall give a performance bond equivalent to 10% of the total cost of the system. The performance bond will cover any cost related to remedies that remained unattended by the provider. At the final reception if parties are satisfied, the performance bond is returned to the installer.

Article 19: Responsibilities during the period of guarantee

Upon the completion of installation of the system and before its operation, the owner of the system shall make sure that:

- (1) Before the final reception, he/she is satisfied about the installation and operation of the system
- (2) The owner shall be liable for the system failure that may be caused by poor operation and maintenance during the guaranteed period and will not be allowed to do any repair without the consent of the provider/installer of the system.
- (3) Any request for repair will be done in writing
- (4) The installer shall diligently attend to any request for a redress of the system failure and shall be held responsible for the maintenance and repair that the system may need.

Article 20: Final Reception

At the end of the period of guarantee, the installer shall notify the owner the date for the final reception. The final reception shall be subject to a satisfactory functioning of the system. Any reserve will be highlighted and parties will agree on timeframe for remedy.

If parties are satisfied, the performance bond is returned to the installer and the latter is discharged from any responsibility related to the contract.

Article 21: Power supply

For sewage treatment system that requires power, the power supply shall comply with applicable rules and regulations to avoid any effect to the system failure.

The treatment facility shall dispose of alternative power supply such as a generator to account for power supply failure.

Article 22: Discharge level

Systems shall be operated in such a way that no discharge pool is on the surface and the discharge point for the final treated effluent shall be convenient and safe.

Article 23: Suitable Materials

The installation of sewage treatment system must use suitable materials such as:

- (1) Use a sewer system made of suitable materials
- (2) Use watertight tanks that can withstand corrosion and pressure from unsaturated soil
- (3) Material used to surround the treatment system to support, stabilize and maintain its position firmly in the ground should be of the type specified by the manufacturer.

Article 24: Degreasing

Food-service operations must use grease traps to prevent excessive discharge of grease into the wastewater collection and treatment system to avoid any interference of slug loads of grease with the performance of both collection and treatment system that may be caused by grease traps when they are not properly maintained.

CHAPTER 5: OPERATION AND MAINTENANCE

Article 25: Requirement for system maintenance

Any operation of wastewater treatment system shall be subject to adequate and regular maintenance.

- (1) Maintenance will be done as suggested by the installer
- (2) Operation and maintenance of sewage treatment systems will be performed by a competent individual/organization
- (3) The system provider guarantees an after sale service

Article 26: Operation and maintenance process

(i) The operator of wastewater treatment system shall ensure optimum performance of sewage treatment systems by providing his/her personnel with an adequate training in both routine operations and maintenance procedures including but not limited to:

- (1) To check frequently for possible nuisance conditions such as insects, leakages and odour
- (2) To check the operation of pumps, control switches and alarm system
- (3) If disinfection is necessary, check that chemical dosage rate is satisfactory by testing for a disinfectant residual and check that an adequate quantity of disinfectant is available. Further, check the lamp conditions in case of UV are used.
- (4) To check operation of humus sludge and effluent recirculation
- (5) To clean contact tank and remove any sludge accumulation from bottom of tank
- (6) To clean and overhaul system and equipment as required.

(ii) The operator/owner must follow engineering construction, maintenance and operational best practices to ensure consistent, effective and safe performance of the system.

(iii) Extreme care shall be exercised in the operation of machinery during or after installation to prevent damage to the system.

(iv) All reasonable measures must be taken to prevent any mechanical, electrical or operational failures and malfunctions and wastewater overflow shall be prevented from the system.

(v) An operation and maintenance manual for the owner's use shall be provided by the installer.

Article 27: Preparation of Operation and maintenance manual

All sewage treatment systems shall have an operation and maintenance manual provided by the installer and these manuals must be consulted, reviewed and revised regularly.

Operation and Maintenance manuals shall include, *inter alia*:

- (1) Name, address, telephone number and the license number of the system designer and/or installer;
- (2) Design flow and performance requirements for the system
- (3) The de-sludging frequency
- (4) A list of substances that could impair performance if discharged to the system
- (5) Preventative and Operational strategies, rules and procedures for both normal operation and emergency situations when public health and the environment are at risk such as:
 - a. Proactive maintenance activities in known problem areas in the system
 - b. Routine clean-out of pipes
 - c. Maintenance to prevent or minimize deterioration of sewer lines
 - d. Maintenance of sewage pumping stations
 - e. Responses to overflows, chokes, sewage pumping station failures and offensive odour incidents
 - f. Health and safety advices

Article 28: De-sludging requirements

Periodical removal of sludge from inside the treatment system is required to ensure that the system continues to operate satisfactorily and to produce quality effluent.

De-sludging shall meet the following requirements:

- The system must be de-sludged in accordance with the manufacturer's/installer's recommendations
- Sludge must be transported by a licensed company/ cooperative and the sludge should be taken to a waste reception facility recognized by the regulator.
- The de-sludging frequency must be defined in the Operation and Maintenance manual as provided by the installer or designer of the system.
- Operators are required to take all reasonable steps to ensure that the sludge is safely disposed.

- The de-sludging contractor must comply with regulatory requirements, Health and Safety practices and correct sludge disposal practices.

CHAPTER 6: MONITORING, RECORDING

Article 29: Effluent quality monitoring

(i) The operator of a treatment system must undertake a monitoring schedule of the waste discharge as follows:

- (1) Representative samples are to be obtained at the sampling points at least once every three (3) months.

The following effluent parameters should be measured: Biochemical Oxygen Demand (BOD), Suspended and dissolved solids, E. coli bacteria, Ammonia (as N), Total nitrogen, Total phosphorus, Total residual chlorine (if used) and Turbidity. Key reference documents are existing national standards on domestic and industrial effluent disposal.

- (2) All samples must be obtained by or under the instruction of a qualified analyst

- (3) Samples must be preserved and analyzed by a recognized laboratory.

- (4) All sampling of both domestic and industrial wastewater shall be in accordance with existing effluent disposal standards

The quality of wastewater discharges must be monitored weekly

(ii) In case of any doubt on the laboratory results provided by the owner, the regulator or any person recommended by the regulator to track the systems discharge may request further samples for analysis. The cost for the test will be under the owners' charges.

No person shall break, damage, destroy, deface or tamper or cause or permit the breaking, damaging, destroying, defacing or tampering with any part of a sewage works or any permanent or temporary device installed in a sewage work for the purpose of measuring, sampling and testing of sewage.

Article 30: Recording requirements

The operator shall, with regard to the monitoring, maintenance and inspection program:

- a) Keep the results of all analyses, observations and measurements accurately recorded and signed by a responsible officer
- b) Keep the date and time of all sampling, inspections and maintenance works well recorded
- c) Make the results of the monitoring program available to an authorized officer of the responsible authority upon any request to do so
- d) Keep all results for a period of 3 years minimum.

Article 31: Reporting requirement

It shall be an obligation for the Service provider to submit an annual report in the format to be prescribed by the Regulator.

Any information on the occurrence of any incident that has or is likely to have a detrimental impact on the environment must be reported to the Regulatory Authority within 3 days.

Article 32: Inspections

In the framework of monitoring the provision of sewage treatment services, the sewage treatment systems are regularly inspected by the Regulator with the objective of:

1. Recommending the service provider on how to improve the quality of services offered, complying with existing regulations.
2. Providing information about the type and condition of sewage treatment systems as observed at a specific date and time.
3. Suggesting additional testing or corrective actions regarding system components where needed.

CHAPTER 7: HEALTH & SAFETY

Article 33: Health and Safety

The operator shall ensure that technicians are aware and understand all the Health and Safety practices/advice given in the Operation and Maintenance Manual. Considerations shall be given to the safety of sewage works personnel and visitors.

The following general safety considerations shall be observed:

- (1) The designer shall consider all applicable laws and regulations such as Occupational Health policy, Labor code, and etc during the design.
- (2) Protective clothing or equipment including noise arresters, noise protection, gas masks, safety shoes and eye washes, ladders, warning signs, smoke detectors, toxic gas detectors, fire extinguishers, etc shall be available and utilized for all operations or procedures to minimize injury/hazard to personnel.

Article 34: Particular Hazards

Equipment and chemical suppliers shall be contacted regarding particular hazards caused by their products and appropriate steps shall be taken to ensure safe operation.

Adequate provision shall be made to effectively protect systems personnel and visitors from hazards such as physical injuries, infections, asphyxiation and poisonous gases.

The following should be considered to satisfy health and safety needs and to avoid possible hazards:

- (1) Enclosure of the system site with a fence and signs designed to discourage the entrance of unauthorized persons and animals
- (2) Provide access to the top of any system by means of a stairway or step-type ladder.

- (3) Avail First aid equipment;
- (4) Provide No Smoking signs in hazardous areas;
- (5) Provide protective clothing and equipment, such as gas detection equipment, goggles, gloves, hard hats, protective masks, Rubber boots (leather and wool clothing should be avoided near caustics);
- (6) Gas detectors shall be listed and labeled for use
- (7) Provide warning signs for slippery areas, open service manholes, hazardous chemical storage areas and flammable fuel storage areas; excessive noise areas and confined spaces.
- (8) Equipment must be electrically isolated before any maintenance work is carried out.
- (9) Provide adequate ventilation in pump station areas
- (10) All operations and maintenance must be carried out by suitably trained and qualified personnel.

CHAPTER 8: FINAL PROVISIONS

Article 35: Penalties

Every authorized Service Provider must abide by the provisions of these Regulations. Violation of these regulations shall be subjected to the following penalties:

1. Any installer operating without a License issued by the Regulator shall be liable to a fine of three hundred thousand Rwandan francs (300,000 Rwf) and suspension of his/her activities until he/she gets the license.
2. Any owner who discharges effluent which does not comply with the effluent discharge standards and any person, who abandons or disposes sewage in an unauthorized place shall be liable to penalties provided by laws.

Article 36: Repealing Provision

All previous provisions contrary to these regulations are hereby repealed.

Article 37: Coming into force

These regulations shall come into force on the date of its signature.

Done at Kigali, 08/ 06/ 2012

(Sé)

**KAZIGE Eugene
CHAIRMAN OF THE REGULATORY BOARD**