



Arkansas Department of Health
ONSITE WASTEWATER SYSTEMS
MONITORING PROGRAM

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RULES AND REGULATIONS
PERTAINING TO

GENERAL SANITATION



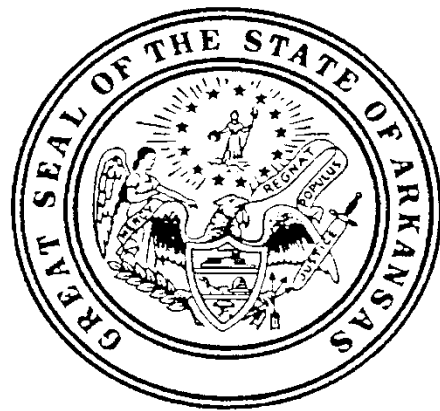
ARKANSAS DEPARTMENT OF HEALTH
LITTLE ROCK

Program Regulations

ADH General Sanitation Regulations require a maintenance contract and monitoring for all surface discharging systems. (*Act 96, 1913*)

Arkansas Pollution Control and Ecology Commission

Regulation 3



Licensing of Wastewater Treatment Plant Operators

Adopted by the Arkansas Pollution Control and Ecology Commission
on February 4, 2000

Chapter Three: Requirements for Licensure

“Anyone whose regular job duties may directly affect the process operation of the wastewater treatment plant must obtain a license under this regulation.”

ARKANSAS DEPARTMENT OF HEALTH

ACT 402 of 1977
AS AMENDED

(Arkansas Code of 1987 Annotated S 14-236-101 et seq.)



ONSITE WASTEWATER SECTION

Revised 2007

- **Certified Maintenance / Monitoring Personnel (CMP)**
- **Individual registered by the ADH to conduct assessments**
- **Registration (License)**
- **License Fee, renewal date**
- **Late Fee (1/2 of renewal fee sixty days after the annual expiration date)**
- **Annual Training**

ARKANSAS STATE BOARD OF HEALTH

**RULES AND REGULATIONS PERTAINING TO ONSITE
WASTEWATER SYSTEMS**



Promulgated Under Authority of Ark. Code Ann. § 14-236-101 et seq.

Effective August 1, 2012

**Environmental Health Protection
Arkansas Department of Health
Paul Halverson, DrPH, FACHE, Director**

These Rules and Regulations establish design, installation and monitoring requirements for standard, alternate, and experimental systems.

Onsite Monitoring Program Objectives

- **Improve the overall health and safety of Arkansans.**
- **Provide water protection for the State of Arkansas.**
- **Maintain Database of systems requiring monitoring (*Enforcement*).**
- **Maintain List of Certified Monitoring Personnel (*Healthy.arkanas.gov*).**

Onsite Monitoring Program History

- **Monitoring Program Implementation Date: June 2, 2003**
- **Onsite Monitoring Program (OMP) is not retroactive; However, existing systems can be added to the program.**
- **Certified Monitoring Personnel (CMP)**
- **Maintenance/Monitor Experimental Systems**
- **2009 Arkansas Department of Environmental Quality**
- **Revised Rules and Regulations Pertaining to Onsite Wastewater Systems 2010 Revision – *Monitoring Only***

Arkansas Department of Environmental Quality

ADEQ

- **Surface Discharging Systems require an NPDES Permit** (*National Pollutant Discharge Elimination System*)
- **< 1000 GPD, General Permit ARG550000**
- **Permit Renewed every 5 years (starting 2009)**
- **Effective Date 07/01/14 Expiration Date 06/30/19**
- **Individual Permits (AR000000)**
- **Class V Injection Well Permits**

Wastewater License

NPDES General Permit ARG550000

- **Operator must have a Class II Wastewater License**
- **Quarterly Inspections**
- **Biannual Discharge Testing and Reporting**

Wastewater Operator Responsibilities

- **Maintaining treatment unit to meet compliance requirements.**
- **Correcting/Adjusting treatment process**
- **Cleaning components.**
- **Adding treatment products.**

Governing Agencies

- **Arkansas Department of Health**
- **Arkansas Department of Environmental Quality**
- **Environmental Protection Agency**



Authority to Inspect Wastewater Systems

Arkansas Department of Health

Rules and Regulations

Pertaining to Onsite Wastewater Systems

- **Section 13, Onsite Wastewater Systems Monitoring Program (*OMP*)**
- **Certified Monitoring Personnel/Provider (*CMP*)**

Requirements for CMP Licensing

- **Attend CMP Training**
- **Pass the CMP Exam**
- **\$50 Annual License Fee**
Due on or before January 1 of each year
- **Expires December 31**
- **Annual Recertification**
Due with payment
- **Late fee, if received after March 1**
- **Retest, if not received after one year**

Monitoring

- **Assessing wastewater system components for proper working order** (*Including: disinfection devices, filters, floats, pumps, percent solids in tanks, equal distribution*).
- **Determine if the wastewater system is functioning as designed.**
- **Determine if the wastewater system has been altered from the original design or if site has been disturbed.**

Monitoring vs. Repair

**CMP may check float
operation**

**May NOT install
chlorinators**

**CMP may check pump
operation**

**May NOT replace
pumps**

*Any **REPAIR** to the system must be made by an ADH
Licensed Septic System Installer.*

Proprietary Systems without an NPDES Permit

Require training & certification from the system manufacturer, in addition to OMP Certification.

- **Aerobic Treatment Units**
- **Peat and Synthetic Media Filters / Proprietary Media Filters (PMF)**
- **Aerobic Biological Generators (ABG)**

Wastewater Systems Requiring Monitoring Contracts

- **Experimental Systems** (*i.e. Secondary Treatment Discharging into a Reduced Drain Field*)
- **Commercial Establishments with an ABG - Aerobic Biological Generator** (*i.e. Restaurants*)

Alternate Systems:

- **Surface Discharging Systems without an NPDES Permit**
- **Holding Tank**
- **Drip Dispersal** (*Inspected four times a year*)

Monitoring Contracts Shall Include:

- Frequency of Assessments
- Assessment of System Components
- Assessment of Grease Interceptor Maintenance*
- Reporting Assessments to Health Department
- *Free Chlorine Residual Measurement**
- *Assessment of Discharge Route**

*** If Applicable**



Assessment Frequency

- **Minimum every 6 months**
- **Additional monitoring terms and services may be required by the Department for approval of systems permitted under the variance and experimental sections**
- ***Drip Dispersal every three months***

Onsite Wastewater System Assessment

EHP-71

**Assessments or inspections are entered into
the electronic data base.**

**No paper copies are mailed to the Central or
local offices**

**Must be assigned a login and password
before using web portal.**

Systems Out of Compliance

- **Send Assessments to all parties.**
- **OMP Supervisor may call or send letter of noncompliance, depending on the infraction.**
- **Environmental Health Specialist may conduct site inspection, if necessary.**
- **May issue General Sanitation Notice or Letter of Noncompliance.**
- **Homeowner has 30 days to comply.**

Failure to Submit Assessment

- **Quarterly Database Reports.**
- **Letter of noncompliance sent to homeowner &**
- **Local Environmental Health Specialist.**
- **General Sanitation inspection procedures.**
- **Homeowner has 30 days to respond.**

Contract Cancellations

If the maintenance contract is terminated,
the CMP is to notify:

- **OMP Supervisor, ADH Little Rock**
- **Mark the contract canceled in the reporting program.**

~~*Contract*~~

What is Wastewater?

- **Wastewater:** Any sewage containing animal or vegetable matter in suspension or solution, including but not limited to liquid wastes from toilets, kitchen sinks, lavatories, washing machines and other plumbing fixtures.
- **Domestic Wastewater:** All wastes discharging from sanitary conveniences and plumbing fixtures of a domestic nature exclusive of industrial and commercial waste. **Waste strength less than TSS 300 mg/L, BOD₅ 300 mg/L, FOG 25 mg/L, after Primary Treatment.**

Onsite Wastewater System

- A single system of treatment tanks and/or renovation facilities used for the treatment of domestic wastewater, exclusive of industrial wastes, serving only a single building, commercial facility such as an office building, or industrial plant or institution.

Holding Tanks

- **Considered an Alternate System.**
- **A visible and/or audible high water alarm indicating when the tank has reached 75% capacity.**
- **Contract with a licensed pumper.**
- **Contract with a CMP.**
- **Not considered waste treatment.**

Primary Treatment

Septic Tank / Trash Tank / Primary Clarifier

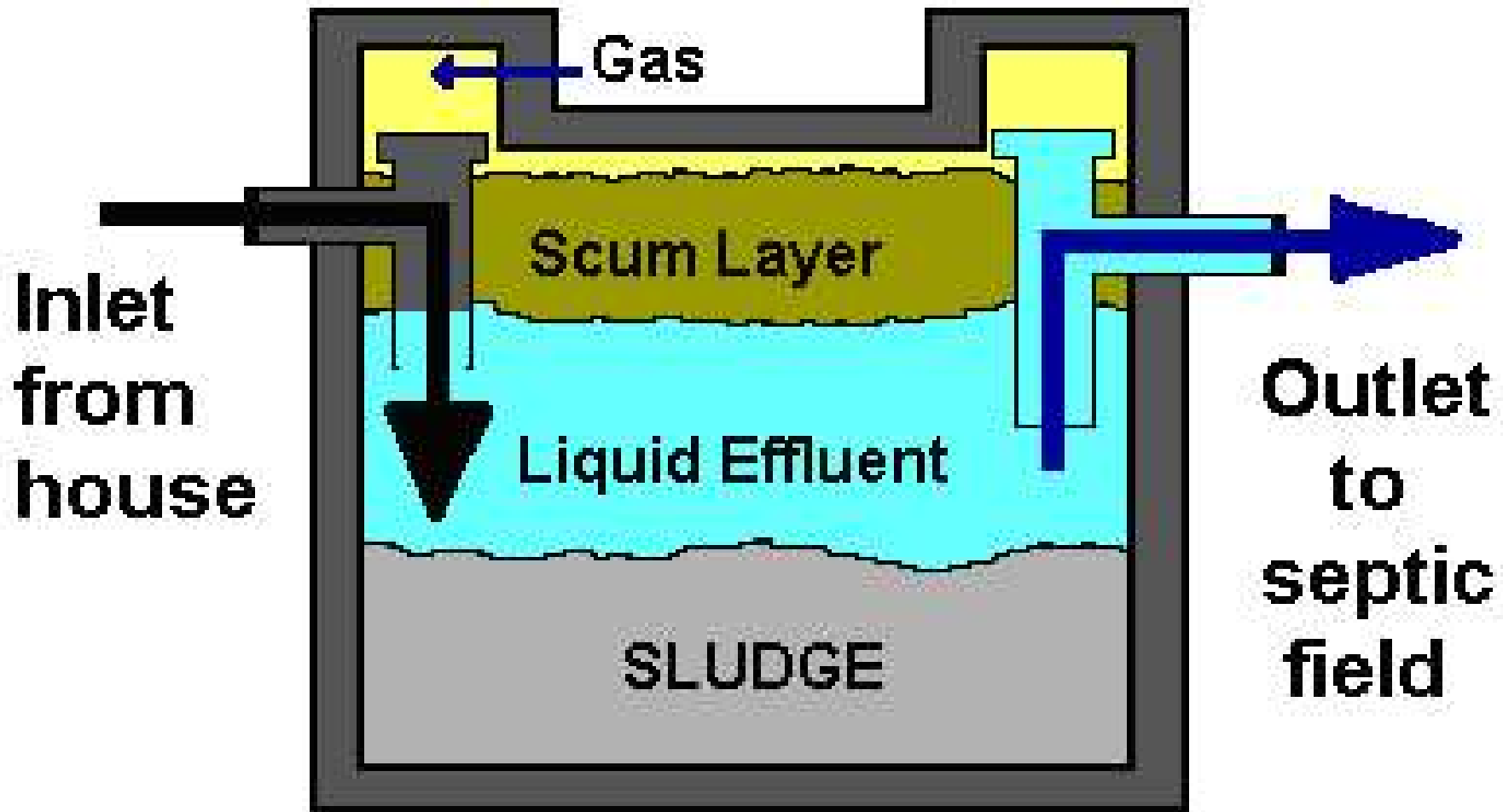
- Partial digestion of accumulated solids by anaerobic bacteria.
- Storage of scum and sludge.
- Reduces Biochemical Oxygen Demand (*BOD*) and Total Suspended Solids (*TSS*).

Concrete Septic Tank




SEPTIC TANK

- **Scum Layer:** Floats to surface and may contain Fats, Oils & Grease.
- **Sludge Layer:** Solids sink to the bottom and may contain Heavier Organic & Inorganic Materials.
- **Effluent Filter Recommended.**

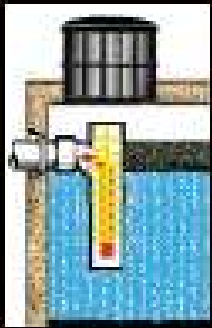


Profile of a typical septic tank

Effluent Filters




1/10" Filtration




TUF-TITE Solution
The TUF-TITE Effluent Filter allows solids down to 1/10" (increasing) to be captured.

Effluent Filter




EF-4

Filter & Housing



EF-4 Combo

T-Baffle™ Inlet/Outlet Tee/Filter-Housing



SC4-40 to 8000-03 reducer included

TB-4 injection molded PVC



Monitoring Requirements For Septic Tanks

- Check Sludge Depth *(25% of liquid depth)*
- Pump Solids Out (3-5) years*
- Inspect Effluent Filter *(every service call)*
- Check Baffles

* *Requires a licensed septic tank cleaner.*



**A Handy
Tool
the
“Sludge
Judge”**

Determines Sludge Depth

Settling Rate

Access Health of Microbial Population



Secondary Treatment

ABG, ATU, PMF, ISF, RS/GF, RPF

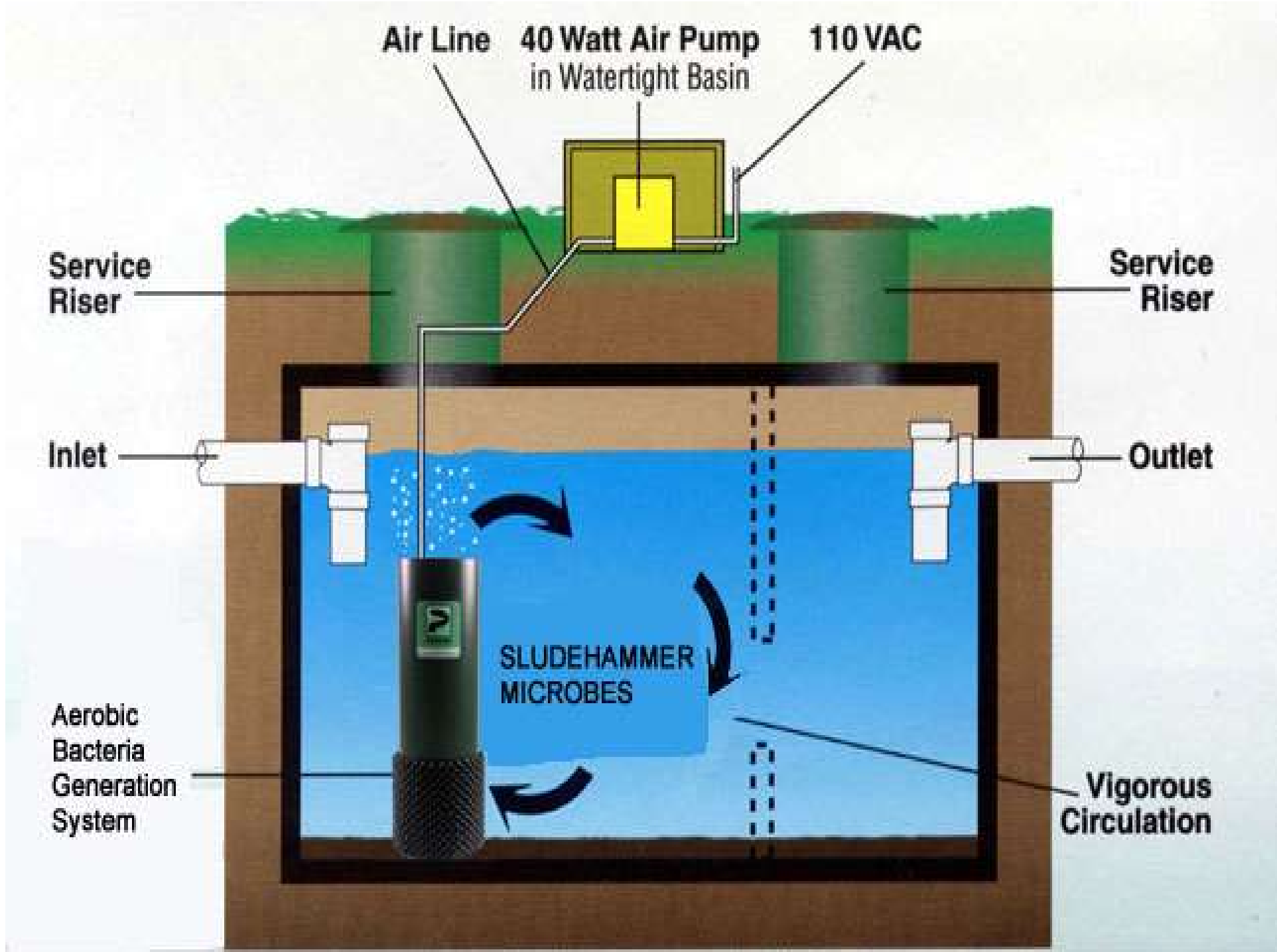
- **Removes dissolved and suspended biological matter utilizing Aerobic Bacteria.**
- **Treatment performed by indigenous, water-borne micro-organisms in a managed habitat.**



Aerobic Biological Generator

ABG or High Strength Effluent Reduction Device

- **Reduction of effluent strength in commercial establishment where the wastewater strength is greater than residential/domestic wastewater.**
- **Reduces BOD, TSS and FOG (fat, oils and grease)**
- **H.S. reduction device rely on the introduction of both large amounts of air and a select group of bacteria.**



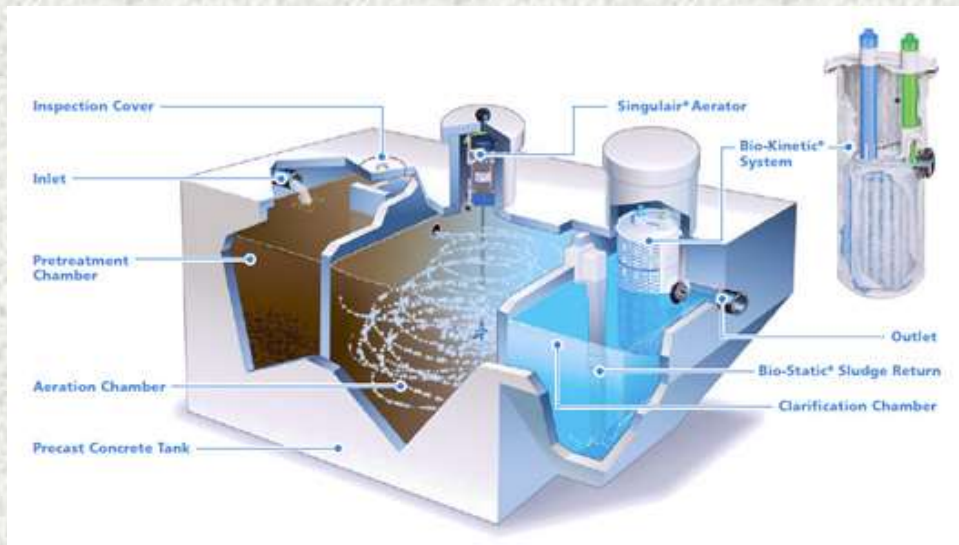
ABG Maintenance

- **Check air pump for proper operation.**
- **Clean or replace air filter on air pump as recommend by the manufacturer.**
- **Remove old bacteria pack from unit and dispose properly.**
- **Install new bacteria pack in unit every 6 months.**

Aerobic Treatment Unit (*ATU*)

- **May combine Primary and Secondary Treatment**
- **Aerobically Activated Sludge Process**
- **Start up time (*up to 6 weeks*)**

Types of ATUs



Types of ATUs



Secondary Treatment

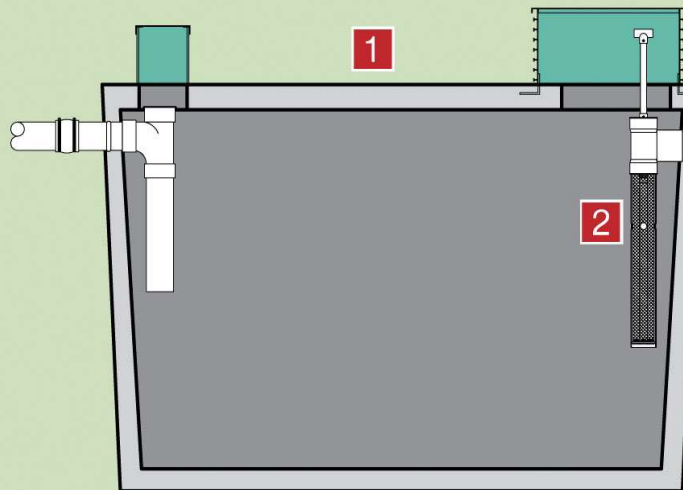
Proprietary Media Filter

- **Filters**
- **Aerobically Activated Bacteria**
- **Start up time (*N/A*)**

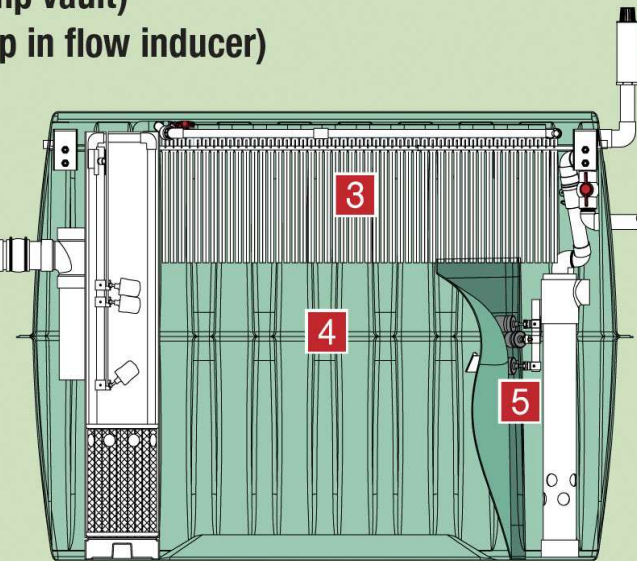
Proprietary / Fixed Media Filters

The system has five main functional parts:

1. Septic tank
2. Biotube® effluent filter
3. Textile sheets
4. Recirculating section of tank (with Biotube pump vault)
5. Discharge section of tank (with discharge pump in flow inducer)

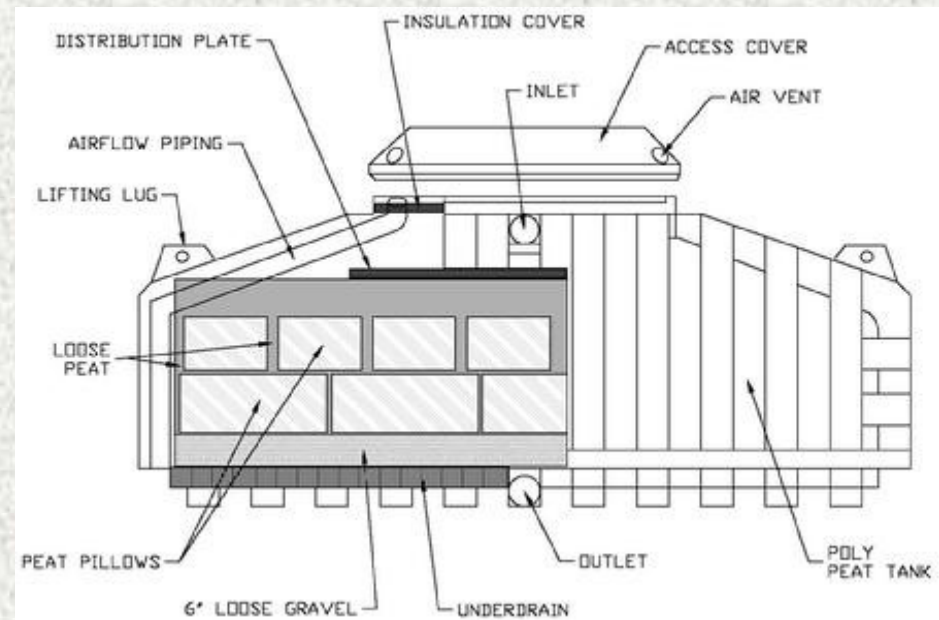


1000 gal. Primary Tank - Side View



800 gal. AX20-RT - Side View

Peat Filter



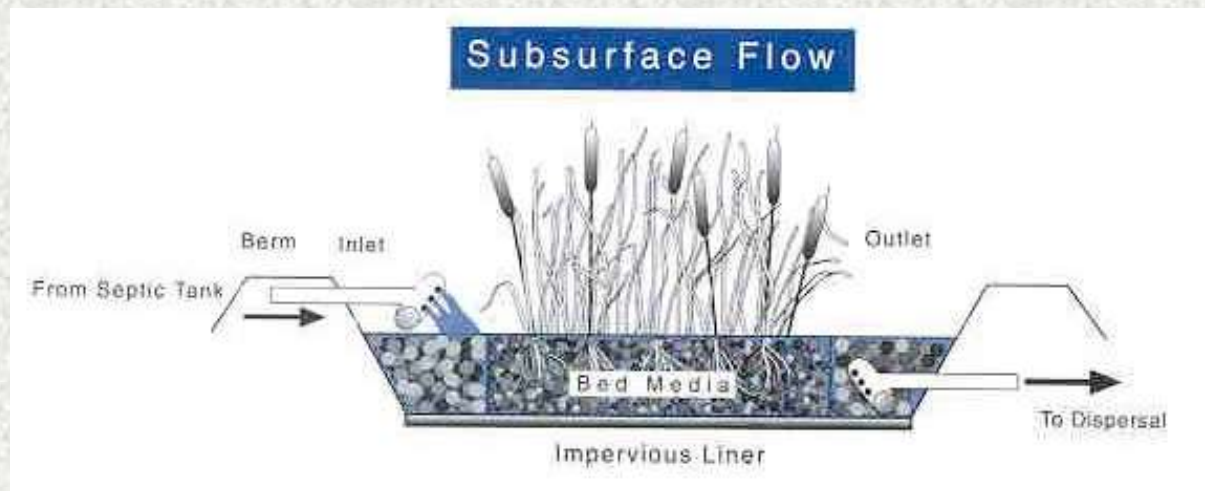
Additional Secondary Treatment System Types

- **Rock Plant Filter (RPF) “no longer permitted”**
- **Intermittent Sand Filters (ISF)**
- **Recirculating Sand/Gravel Filter (RS/GF)**
- **Oxidation Lagoon “no longer permitted”**

Rock Plant Filter (*RPF*)

“not permitted”

- **Passive**
- **Design**
- **Maintenance**



Sand/Gravel Filters



Sand/Gravel Filters

Media less than 2 millimeters in diameter is sand and anything larger is referred to as gravel. Sand and gravel have been used in media filters for decades. Sand, through which wastewater flows relatively slow, is typically used for [single-pass](#) filters. Gravel is typically used for [recirculating filters](#) which can accept larger amounts of wastewater than single-pass sand filters.

Intermittent Sand Filter

- **Single pass sand filter**
- **Uses more media**
- **0.25-0.5 mm sand particle size**
- **Larger “foot print”**
- **May be used for Tertiary Treatment
(*a.k.a. Polishing Filter*)**

Recirculating Sand/Gravel Filter

- **Multiple pass sand/gravel filter**
- **Uses less media**
- **Very Coarse Sand 1.5-2.0 mm/Pea Gravel**
- **Smaller “footprint”**



Sand/Gravel Filter

- Liner (*30 mils PVC*)

Prevents

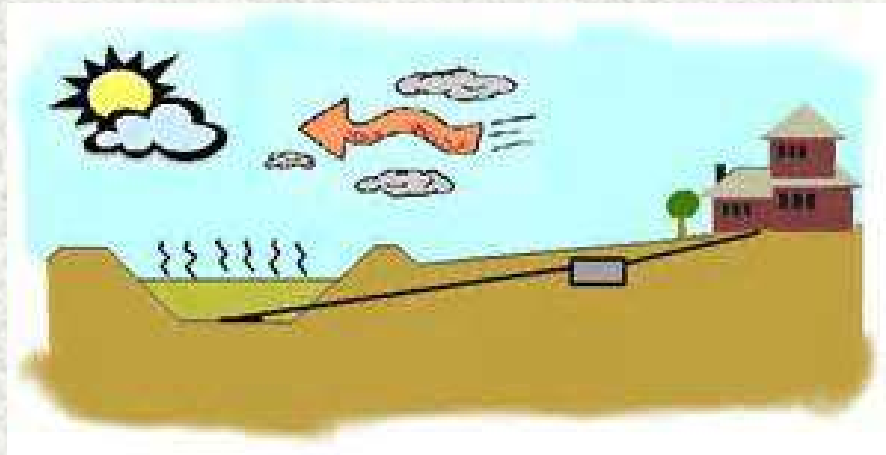
- groundwater infiltration
- sewage exfiltration



Utilizes Low Pressure Distribution



Oxidation Lagoon “no longer permitted”



- **Passive**
- **Design**
- **Maintenance**



Disinfection of Sewage Effluent

- **All Surface Discharges Must Be Disinfected**

Tertiary Treatment

Disinfection

- **Chlorination**
- **Ultraviolet**
- **Ozone**
- **Future: Hydrogen Peroxide**

Chlorination

Most Common

Calcium Hypochlorite Tablets

Positive Contact, Dry Feed
Chlorinators



Chlorination

Positive Contact, Dry Feed Chlorinators

- **Tablets are expensive**
- **Tablets can absorb moisture**
- **Owners try to substitute swimming pool tablets**
- **Tablets hazardous around petroleum products**
- **30 min minimum contact time**
- **30 gal minimum contact chamber for residences**

Chlorination

Hypochlorinators

- **Liquid Feed**
- **Requires a pre-mixed solution of hypochlorite**
- **Timer pumps solution into contact chamber**
- **Rarely seen on residential systems**

DISINFECTION MONITORING

- **Chlorine Residual Report (*Biannual*)**
 - ✓ **Fecal coliform sampling required, if chlorine residual is less than 0.1 ppm.**
 - ✓ **Fecal coliform sample continued until acceptable results are obtained.**
- **Annual fecal coliform samples are required on assessments of systems using ozone or ultra violet disinfection.**

Disinfection

Ultraviolet Light Units (UV)

Advantages

- Ultraviolet light kills micro-organisms
- Advantages
- Simple, no moving parts
- No residual left in wastewater

Disadvantages

- Requires electricity
- Tubes must be cleaned regularly
- Must be protected from the elements
- No residual left in wastewater
- Turbidity can mask or hide bacteria
- Expensive

Disinfection

Ozone Units

Advantages

- Ozone kills micro-organisms. Produced by passing air over electric spark.
- Simple, few moving parts
- No residual left in wastewater

Disadvantages

- Expensive
- Requires Electricity
- No residual left in wastewater

Effluent Distribution

- **Standard Absorption Trenches**
- **Shallow/Reduced Absorption Trenches**
- **Low Pressure Distribution**
- **Drip Dispersal**





Low Pressure Distribution

- Equal Distribution
- Small Pipe, 1¼” – 2” Sch. 40 PVC
(*Polyvinyl Chloride*)
- Gate Valves
- 1/8” to 3/16” orifices
- Orifice Shields



Drip Dispersal

A network or grid of closely spaced small diameter tubing which has been plowed into the soil at a very shallow depth.



Drip Dispersal

- **Primary and Secondary Treatment**
- **Micro Doses**
- **Higher Head Pump**

Drip Dispersal

System Components

- **Headworks Assembly**
- **Filters (Disk or Screen)**
- **Filter and field flush valves**
- **Drip Tubing**
- **Pressure Gauges or points**
- **Flow Meter**
- **Air Release Valves**



Problems and Solutions

- **Homeowner**
- **Pretreatment**
- **Mechanical**
- **Distribution**

Mechanical Components

Problem

- **Pump or Motor**

Solution

- **Power Supply**
- **Control Panel**
- **Wiring**
- **Floats**
- **Clogged Pump Intake / Debris Wrapped Propeller**

Low Pressure Distribution

Problem

- Unequal distribution
- Clogged orifices
- Increases pump run time

Solution

- Clean lines and manifold
- Remove end caps, blow out lines
- Use brush / snake device

Sand/Gravel Filter

Problem s

- **Ponded filter**
- **Excessive bio-mat**

Solutions

- **Compare actual flow with design flow**
- **Check Solids level in pretreatment tank**
- **Air tubes/injection**
- **Chemically oxidize bio-mat**
- **Replace media**

Sampling Sewage Treatment Systems

Sampling Frequency

BOD & TSS

**Not required by Health Department
at this time**

DEQ may require 2 / year

Chlorine residual two / year

Sampling Sewage Treatment Systems

Sampling Frequency (cont.)

Fecal coliform sample

Required when no chlorine residual

**An acceptable sample is
< 200 colonies / 100 ml**

Annual Sample Required For UV and Ozone

pH two times / year

Sampling Sewage Treatment Systems

Sampling ports

Required on all new discharging systems

May need to retrofit on old systems

Locations for best results:

Outlet of chlorine contact chamber

System discharge line

Sampling Sewage Treatment Systems

Sampling methods

Technique

IF NO DISCHARGE, INDUCE A FLOW

Turkey baster or similar device

Be careful!

Do not agitate effluent

Clear liquid only

A turbid sample will be a bad sample

Sampling Sewage Treatment Systems

Sampling

BOD & TSS

1 liter container supplied by lab

Ice immediately

Sampling Sewage Treatment Systems

Sampling

Fecal coliform

100 ml container supplied by lab

Use sterile technique

Sanitize equipment before collection

Handle container & lid carefully

Ice immediately

Sampling Sewage Treatment Systems

Sampling

Chlorine

Test at site
Liquid test kit
Test strip

Chlorine residual >0.1 ppm

Sampling Sewage Treatment Systems

Sampling

pH

Test at site
Liquid test kit
Test strip

pH 6-9

Sampling Sewage Treatment Systems Laboratories

EPA / DEQ certified

Find in yellow pages

Sampling Sewage Treatment Systems

Transportation

Follow labs instructions

Four hour time limit is normal

Always ice samples

Documentation

Lab's chain of custody

Health Department's reporting form

Sampling Parameters

Chlorine

0.1 ppm

Daily MCL (Maximum Contaminant Level)

Grab Sample

Fecal Coliform

200/*CFU

pH

6.0-9.0

***Colony Forming Unit**

COMPLIANCE

INDIVIDUAL SEWAGE DISPOSAL ADVISORY COMMITTEE

MEMBERS APPOINTED BY GOVERNOR

ENFORCEMENT ACTIONS

License suspensions, revocations, & fines

APPEALS

Authorized Products

- www.healthy.arkansas.gov
- *Authorized by Product Review Committee*

Relevant Phone Numbers

- ADEQ (501-682-0744)
- ARWA (501-676-2255)
- ADH (501-661-2171)

Contact Person for Onsite Wastewater Systems Monitoring Program Information

Sam Dunn

E Mail: sam.dunn@arkansas.gov

Phone: 501-772-8412

Arkansas Department of Health

Environmental Health, Onsite Wastewater Section

4815 West Markham - Slot 46

Little Rock, AR 72205



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