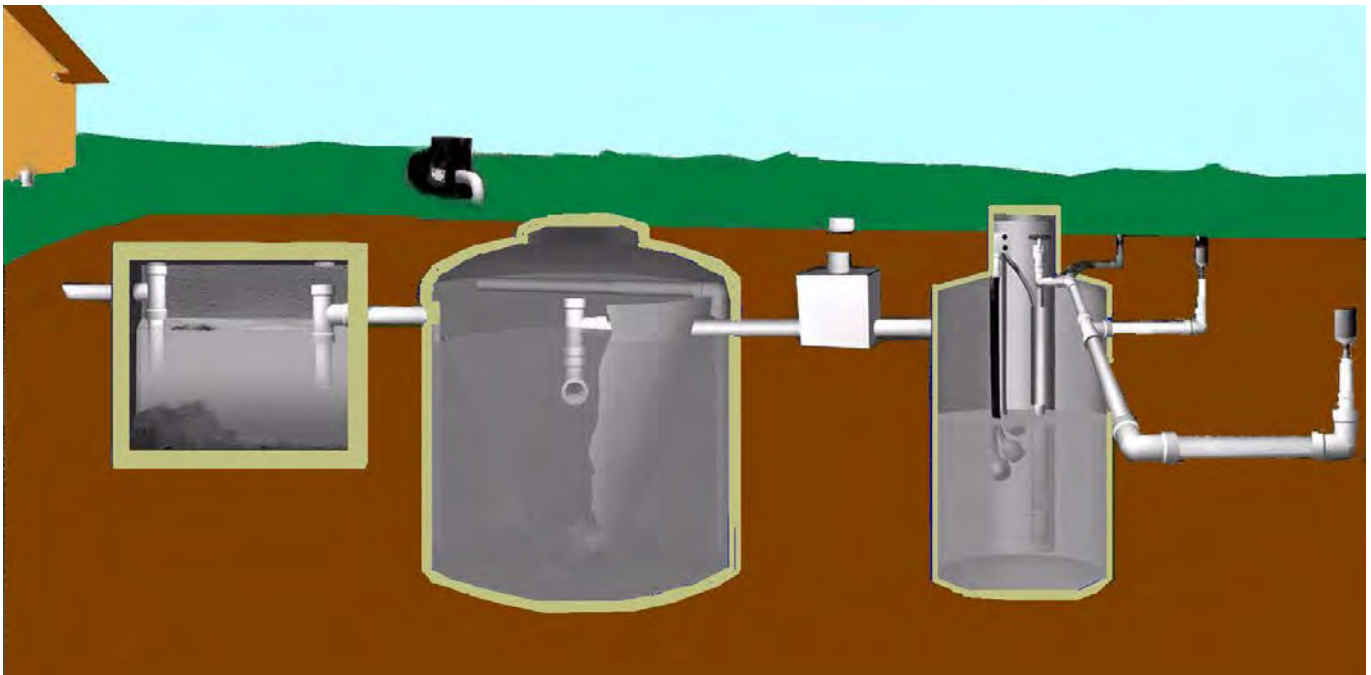


AEROBIC SEWAGE TREATMENT SYSTEM

*It's Your
On-Site System*



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Operation and Maintenance Guide for Homeowners

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
Environmental Complaints and Local Services
P.O. Box 1677
Oklahoma City, OK 73101-1677
(405) 702-6100
or contact your local DEQ office



THE COST OF YOUR SYSTEM

While initial cost of a system is often "the bottom line", don't forget the yearly maintenance costs of a system or the total five year cost of the system. Yearly maintenance costs vary with each type of system that will affect the 5-year total cost of the system. The initial cost plus the maintenance cost over a five year period provides a different view of "the bottom line". While the cost represented below will vary based on which part of the state you live, it does provide a fair representation of basic costs and are for illustration purposes.

Aerobic Treatment with Drip or Surface Irrigation

Five Major Components

- Trash tank or Septic Tank
- Aerobic Treatment Unit (ATU)
- Disinfection Device
- Dispersal method – drip or spray

Average installation cost - \$\$\$\$\$

Average annual maintenance cost – \$

Average 5-year Total Cost -\$\$\$\$\$

Evapotranspiration/Absorption (ET/A)

Two Major Components

- Septic Tank
- Evapotranspiration/Absorption Field

Average installation cost - \$\$\$\$\$

Average annual maintenance cost – \$

Average 5-year Total Cost -\$\$\$\$\$

Lagoon Treatment

Two Major Components

- Septic Tank
- Lagoon

Average installation cost - \$\$\$

Average annual maintenance cost – \$

Average 5-year Total Cost -\$\$\$\$

Subsurface Absorption

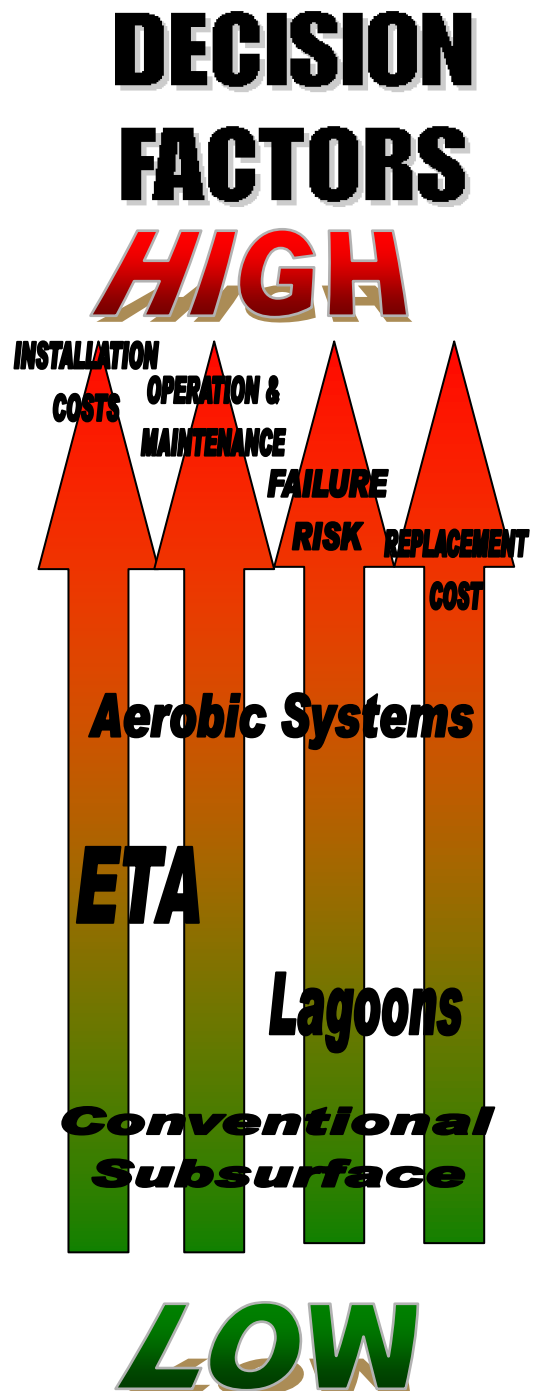
Two Major Components

- Septic Tank
- Absorption Field

Average installation cost - \$\$\$

Average annual maintenance cost – \$

Average 5-year Total Cost -\$\$\$



\$=Low Cost-----\$\$\$\$\$High Cost

WHAT ARE THEY?

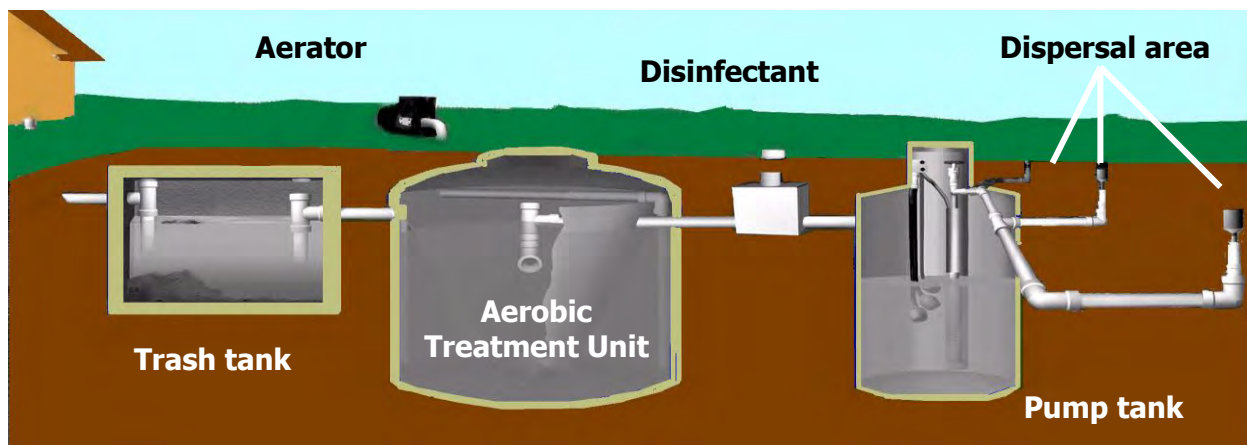
Aerobic treatment systems are on-site sewage treatment systems that use forced air to treat wastewater and surface application or drip irrigation to disperse the treated wastewater. They may also be used to replace subsurface systems that are failing due to high groundwater and/or poor soil. While aerobic systems may be designed without performing a soil test, it is recommended that a soil profile be performed at the site.

Based on the results of the soil profile, you may be able to reduce the size of the dispersal field or install a subsurface system. To determine the type of soil at your location please contact your local DEQ office. All aerobic treatment units must be certified as meeting the most current ANSI/NSF Standard 40, meaning they have been tested to prove that the unit is going to operate as the manufacturer claims.



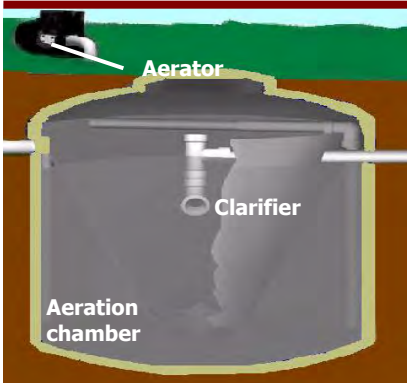
COMPONENTS OF AN AEROBIC TREATMENT SYSTEM

Aerobic treatment systems consist of: a trash tank, an aeration chamber, a disinfection chamber and surface or drip dispersal fields. These components are used to treat, disinfect, and disperse the treated wastewater.



TRASH TANK

The trash tank may be built into the unit or be a separate tank. The trash tank serves as the first stage of treatment where it separates the solids from the liquid allowing only the liquids to flow into the aeration chamber. The minimum size requirement for the trash tank is 300 gallons.

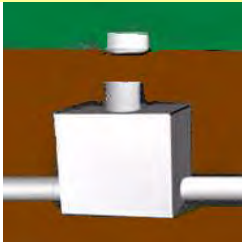


AEROBIC TREATMENT UNIT (AERATION CHAMBER)

Treatment of the wastewater occurs in the aeration chamber. Air is bubbled through the wastewater allowing the natural bacteria to flourish. This bacteria feed on and breakdown the organic material found in the wastewater. The wastewater then flows to the clarifier where the solids are separated from the liquids.



DISINFECTION CHAMBER



After being treated in the aeration chamber, the treated effluent is disinfected between the aeration chamber and pump tank. The most commonly used disinfectant is chlorine. Other disinfection methods include ultraviolet (UV) irradiation and ozonation.



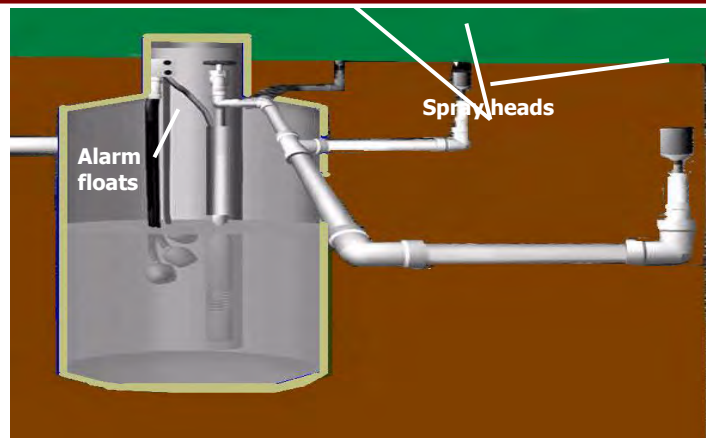
PUMP TANK

The pump tank is used to transport the treated effluent to either the surface irrigation or drip irrigation fields. The minimum capacity of the pump tank is 700 gallons, or, for systems with an average flow over 350 gallons per day, have a capacity of at least twice the average daily flow (a four bedroom home has an average daily flow of about 322 gallons per day).

SPRAY IRRIGATION

Only disinfected effluent may be used for spray irrigation fields. The disinfected effluent is pumped out of the pump tank to sprinklers in the spray irrigation field. The sprinkler system is timed to automatically spray the effluent in the early morning hours (1am-6am) over a large vegetated area.

There has to be sufficient land area available to allow the treated effluent to evaporate and/or be absorbed into the soil. The surface application area must be vegetated and landscaped to prevent runoff.



Surface application area is determined by the estimated or actual water usage, the net evaporation rate for the area, and the types of soil in the first 18 inches of soil. To know the application area required for your location, contact your local DEQ office.

DRIP IRRIGATION

Drip irrigation must be preceded by an aerobic treatment unit. Typically the drip irrigation line is installed less than 10 inches below the surface of the ground. Since drip irrigation is a soil based system, the effluent is not required to be disinfected prior to dispersal.

Drip irrigation uses a special pipe that is specifically designed and manufactured for distributing treated effluent. The effluent is dispersed into the soil through pressure compensating emitters and is pumped to the dispersal field at least four times per day.

The size of the drip irrigation field depends on the type of soil present at the site and the amount of wastewater produced by the residence. Please contact your local DEQ office for assistance in sizing the drip irrigation field.

ALARM SYSTEM



Every aerobic treatment system must have an alarm (visible, audible, or both) that alerts the owner/operator of a system failure. This lets the homeowner know if the aerobic treatment unit or pump tank becomes too full or if there is a malfunction with the system. The control box or alarm box should be kept in a place where the owner/operator can be easily alerted.

MAINTENANCE

Maintenance of an aerobic treatment system is the most important factor insuring proper system operation. DEQ rules require that the aerobic manufacturer or representative (installer) shall provide and sign a



two-year initial service policy, or maintenance agreement, with the owner/operator. After the two years has elapsed, contract renewal is optional. The cost of the initial service policy is included in the original purchase price and contains provisions for four inspection/service visits. These inspection/service visits are used to inspect, adjust, and service the electrical, mechanical and other components. This becomes the owner/operator's responsibility if the two-year initial service policy has expired and is not renewed.

Although some maintenance may be done by the owner/operator most should be performed

by a professional. Poorly maintained systems will not produce properly treated effluent. For the best care, follow the manufacturer's recommendations. As the owner/operator, use these general guidelines as a basis for maintaining your system.

- Aerobic units are designed to treat only household wastewater. If toxic or hazardous materials enter the system, treatment may be affected. (Normal household chemicals will not harm the system).
- Routinely inspect the equalization tank for sludge build up. Equalization tanks may need to be cleaned out every one to two years.
- Check the disinfecting system on a regular basis. Proper disinfection will greatly reduce the risk of pathogens in the effluent.
- Maintain the vegetative cover in the surface application area.
- Observe good water conservation practices.
- If an alarm is activated, call your maintenance provider or a professional.



AEROBIC SYSTEMS

Advantages

- Can be used to correct many failing systems.
- Produce a high quality effluent.
- Are suitable for use in nearly any soil condition
- Do not require a large area.



Disadvantages

- Are expensive to install, maintain and operate.
- May require more maintenance than other on-site systems. Wastewater treatment systems that rely on mechanical parts have the potential to breakdown.
- If any part of the system fails, wastewater will not receive complete treatment, and will result in improperly treated wastewater being discharged into the environment.
- Have a potential problem of downwind drift from the sprinkler system. It is important to observe distance from property line requirements and to install sprinkler heads.

Aerobic System Troubleshooting Guide for Homeowners

Important: If any problems encountered, contact Certified Installer or local DEQ representative

| Problem | Risks | Potential Causes | Potential Remedies |
|---|--|--|---|
| Sewage backs up into house and/or plumbing fixtures don't drain or are sluggish | Human contact with sewage is a serious public health risk. | <ul style="list-style-type: none"> • Excess water entering system • Improper system design • Improper operation • Pump failure • Blockage in plumbing | <ul style="list-style-type: none"> • Fix leaks • Install water-saving fixtures or practice water conservation • Pump out aerobic tank and check pumps • Seal pipe connections • Stop using garbage disposal |
| Sprinklers not working properly | Human contact with sewage is a serious public health risk. | <ul style="list-style-type: none"> • Excess water use • System blockages • Sprinkler head damage • Pump failure or improper operation | <ul style="list-style-type: none"> • Fix leaks • Install water-saving fixture or practice water conservation • Pump out aerobic tank and check pumps • Fence off area until problem is repaired • Consult professional |
| Sewage odors— indoors | Toxic gases can cause discomfort and illness in confined spaces. | <ul style="list-style-type: none"> • Improper plumbing • Sewage backup in house • Roof vent pipe clogged or closed | <ul style="list-style-type: none"> • Repair plumbing • Pump out septic tank and check pumps • Replace water in drain traps |
| Sewage odors— outdoors | Major nuisance, potential health risk | <ul style="list-style-type: none"> • Discharged effluent not being disinfected properly • Overloading system • Source other than owner's system | <ul style="list-style-type: none"> • Pump out aerobic tank and check pumps • Check chlorine and add if necessary • Reduce the amount of chemical poured down drains • Test chlorine residual or BOD content • Check aerator and all filters and seals • Maintain vegetative cover in the application area |
| Lift station alarm activated | Tank effluent may back up into the house | <ul style="list-style-type: none"> • Pump failed • Fuse breaker tripped • Pump unplugged • Controls malfunctioning | <ul style="list-style-type: none"> • Check breaker and plugs • Check controls and pump • Make sure professional replaces pump with proper size unit |

