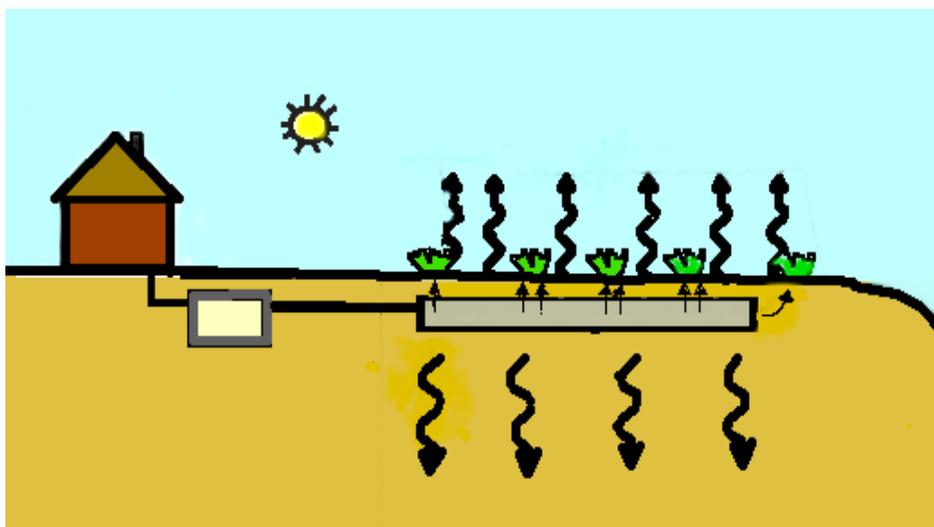


# EVAPOTRANSPIRATION/ABSORPTION TREATMENT SYSTEMS

It's Your  
On-Site System



*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**

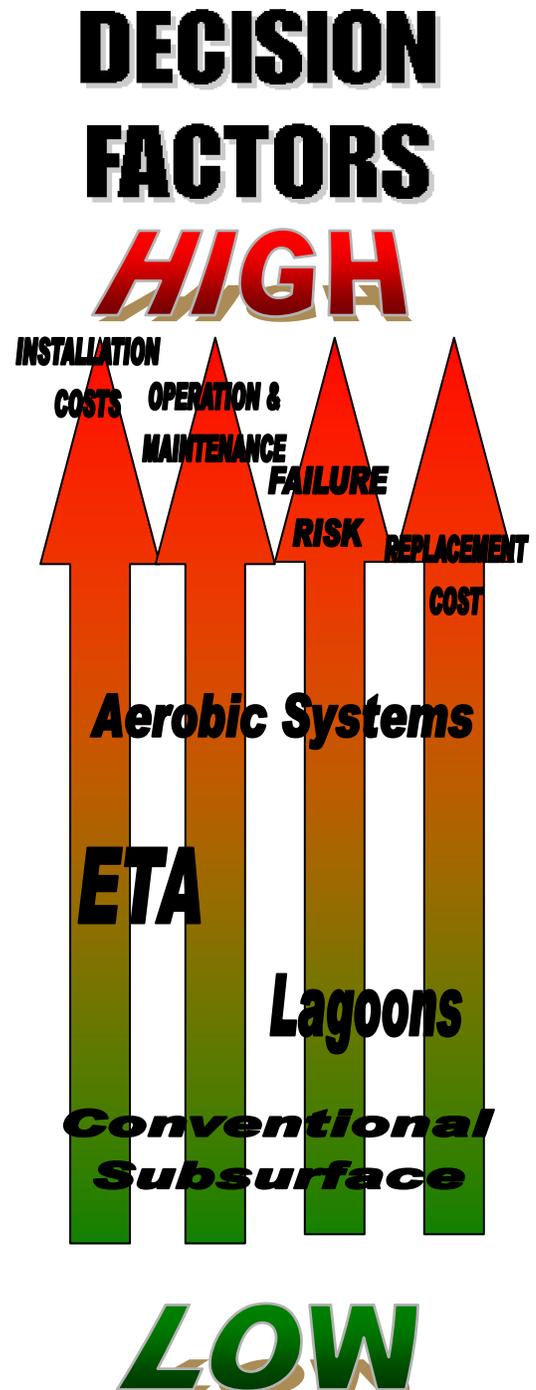
Two Major Components

- Septic Tank
- Absorption Field

Average installation cost - \$\$\$

Average annual maintenance cost – \$

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



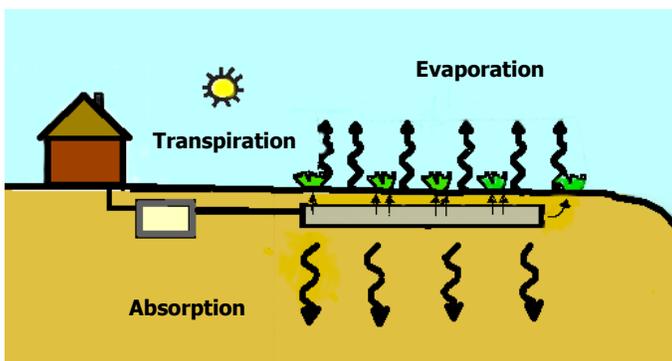
\$=Low Cost-----\$\$\$\$\$=High Cost

## WHAT ARE THEY?

Many of our daily chores such as bathing, doing laundry, flushing toilets, preparing meals, washing dishes and other activities generate domestic wastewater. Few people give thought to where wastewater goes after it disappears down the drain. Domestic wastewater (i.e. sewage) must be properly treated because it contains nutrients, bacteria/viruses and household chemicals that may contaminate the land and waters of our state. In the U.S., we are fortunate to have the technology and the resources available to properly treat our wastewater.

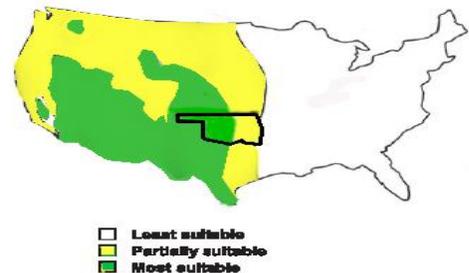


Although a soil test is required, evapotranspiration/absorption (ET/A) systems typically are selected when a soil test dictates that conventional methods are not appropriate. ET/A systems are designed for a specific site and a specific volume of wastewater. Each site is different and must be evaluated individually. Site evaluation information includes: climate, topography, lot size (one acre minimum) and location, estimated water usage, water well locations (your and your neighbor's), location of creeks, rivers, springs, ponds and lakes, or other factors that may affect the location and size of your system.



ET/A systems are designed to disperse effluent exclusively by evaporation, transpiration and absorption. Evaporation is the movement of water from the soil to the atmosphere and is directly impacted by the amount of precipitation and climate. Transpiration involves the removal of water by vegetation or how much water plants can take up using their roots. Absorption relies upon the movement of water through the soil. Since most ET/A systems are installed in soils with high clay content, absorption is not as significant as evaporation or transpiration.

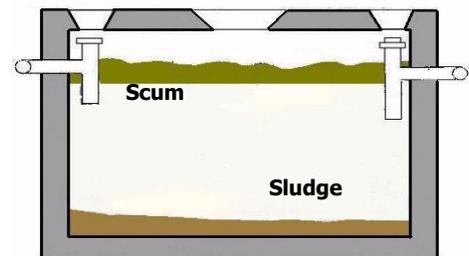
These systems are best suited for dryer climates and locations (see map) where the annual evaporation rate exceeds the annual rate of precipitation. In other words, it evaporates more than it rains. For this reason ET/A systems require large surface areas so ET/A systems are much larger than conventional systems. Typically, ET/A systems are selected when a soil test dictates that conventional subsurface absorption fields are not appropriate.

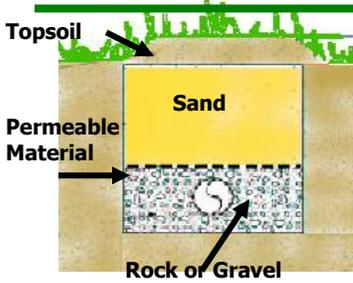


## COMPONENTS OF AN ET/A SYSTEM

### SEPTIC TANK (AKA: PRIMARY TREATMENT)

Primary treatment occurs when wastewater flows into the septic tank where the liquids separate from the solids. The heavier solids settle to the bottom of the tank while the lighter greases and scum float to the top. This material is retained in the tank by vertical baffles. The settling process takes about 24 hours. The natural bacteria in the septic tank begin to breakdown and digest the organic material found in the wastewater. Only the treated liquid (effluent) found in the center level of the tank flows out of the septic tank and into the absorption field. The sludge and scum remain in the septic tank and must be periodically removed to insure that the system operates properly. A properly designed and maintained septic tank will allow only the clarified effluent to discharge from the tank to the ET/A trenches.





## THE ET/A TRENCHES

ET/A trenches are similar to those of conventional systems containing both perforated pipe and gravel. The trenches are 24 inches deep containing a perforated pipe surrounded by ten inches of rock or gravel, and backfilled with sand. Sand is the most important component of the trenches because it allows the wastewater to wick upward so evapotranspiration can occur. The sand is separated from the gravel by a material that allows the flow of water but prevents the sand from washing into the gravel.

## MAINTENANCE OF EVAPOTRANSPIRATION/ABSORPTION SYSTEMS

As a rule of thumb, ET/A systems are underground and out of sight. However, out-of-sight, out-of-mind is a very risky approach to operating and maintaining your system. Think of your septic system as a living biological unit that works for you. You keep it healthy and it keeps you happy. Long-term efficient operation of your system is directly dependent upon how you maintain it. The septic system serving your home is not a permanent or lifetime unit. It will malfunction if not properly maintained. Malfunctioning systems can cause serious risks and degradation of the environment and are often expensive to repair. To ensure continued effective operation, have your septic tank and system inspected annually.



## WHEN TO PUMP YOUR SEPTIC TANK

Under average conditions, you should have your septic tank pumped every three to five years. However, a number of factors impact the frequency of pumping. You may contact a professional to inspect your tank or you can check it yourself (see below). If you or a professional cannot check the tank, tank-pumping frequency can be estimated on the number of people using the system. The following chart may be used as a guideline and should not take the place of a professional inspection or actual measuring of the sludge.



Under average conditions, you should have your septic tank pumped every three to five years. However, a number of factors impact the frequency of pumping. You may contact a professional to inspect your tank or you can check it yourself (see below). If you or a professional cannot check the tank, tank-pumping frequency can be estimated on the number of people using the system. The following chart may be used as a guideline and should not take the place of a professional inspection or actual measuring of the sludge.

### 1000 gallon capacity septic tank

# people using system	1	2	4	6	8
Years between each pumping	12	6	3	2	1

Have all contents removed from the tank. It is not necessary to leave anything in the tank for seeding. Incoming sewage contains all of the necessary bacteria to maintain proper treatment. For a list of licensed septage tank cleaners in your area, contact your local DEQ office or look in your telephone directory.

## HOW TO FIND THE LOCATION OF YOUR SEPTIC TANK AND SUBSURFACE SYSTEM



- If you are present when your septic tank is installed, place a marker over the tank manhole cover.
- The original inspection report for your on-site sewage treatment system should show the location of the septic tank and absorption field. If you do not have a copy, you may obtain a copy at your local DEQ office.
- Contact the previous homeowner.
- Look for a clean-out outside the house. They will usually be located within three feet of the house. Open and see which direction the pipe runs. In soft ground, you may probe the soil with a metal rod.
- If the septic tank is shallow, the grass may look unhealthy or dead on top of it in the summer.
- Most septic tanks have a metal handle in the manhole cover. A metal detector may help locate the tank.

## Checking the sludge depth yourself



Insert six-foot long rod all the way to the bottom of the tank and let it remain for about 45-60 seconds.



After removing, measure from the bottom of the rod to the top of the sludge layer



If the sludge depth measures 25 inches, or a scum and sludge depth of more than one-third of the liquid depth, have a professional pump your tank.

# TIPS TO KEEP YOUR EVAPOTRANSPIRATION/ABSORPTION SYSTEM WORKING PROPERLY

- **Mark the location of your septic tank.** This will help prevent activities that may damage the tank, like someone driving a vehicle over the tank.
- **Conserve water.** A 1,000-gallon septic tank is designed to treat no more than 650 gallons of wastewater per day. Retention time in the septic tank is important. Putting too much water into your septic tank does not allow enough time for the solids to break down and separate.
- **Use of septic tank additives is not recommended.** More than enough bacteria are naturally present in your system to provide the necessary treatment and no product eliminates the need for periodic pumping and inspection. Some products kill the beneficial bacteria in the tank. This will lead to improper treatment and cause the solids to clog the absorption field.
- **Minimize or eliminate the use of a garbage disposal.** Food wastes can fill your septic tank quickly, causing the tank to require more frequent pumping. Also, food wastes that float can increase the thickness of the scum layer. If it becomes too thick, solids could spill into and clog the secondary treatment system. If you plan to use a garbage disposal, increase the size of the tank by 20% and have the tank pumped every one to two years.
- **Do not flush** paper towels, newspapers, rags, plastics, sanitary napkins, tampons, condoms, disposable diapers, dental floss, cat litter, grease, cooking oil, cigarette butts, coffee grounds or other non-biodegradable materials. The microorganisms in the septic tank cannot readily break down these materials.
- **Do not flush harmful substances** such as pesticides, disinfectants, acids, medicines, paints, varnishes, solvents, photo developing solutions, thinners, gasoline, or used motor oil.
- **Minimize the use of harmful substances** such as bleach and drain cleaners. These substances can kill the naturally occurring microorganisms in your system that is essential to proper function. Normal household use of soap, detergents and other household cleaners should not cause problems.
- **Do not drain water** from swimming pools, whirlpools or hot tubs into the system, especially if the water is chlorinated. This can flush the tank of the natural bacteria needed for treatment.
- **Divert surface water runoff** from roofs, patios and driveways away from the absorption field. Do not connect roof drains; basement sumps or foundation drains to the system.
- **Do not** dig, drive on or construct anything over the absorption field.
- The areas over the absorption field should have a **vegetative cover**, which prevents erosion and utilizes excess water.
- **Do not allow trees or shrubs** to grow near the absorption field. Roots can clog, break or block pipes interfering with the distribution of the effluent.
- **Spread out laundry** over several days as opposed to doing many loads in one day. Too much laundry can overload the tank and flush out the natural bacteria.

# ET/A 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"> <li>• Excess water entering system</li> <li>• Improper system design</li> <li>• Roots clogging pipes</li> <li>• Improper operation</li> <li>• Blockage in plumbing</li> </ul>	<ul style="list-style-type: none"> <li>• Fix leaks</li> <li>• Install water-saving fixtures or practice water conservation</li> <li>• Pump out septic tank and check pumps</li> <li>• Replace broken or cracked pipes and remove roots</li> <li>• Seal pipe connections</li> <li>• Stop using garbage disposal</li> </ul>
Sewage surfacing in yard	Human contact with sewage is a serious public health risk.	<ul style="list-style-type: none"> <li>• Excess water use</li> <li>• System blockages</li> <li>• Improper system elevations</li> <li>• Undersized soil treatment system</li> <li>• Pump failure or improper operation</li> </ul>	<ul style="list-style-type: none"> <li>• Fix leaks</li> <li>• Install water-saving fixture or practice water conservation</li> <li>• Pump out septic tank and check pumps</li> <li>• Fence off area until problem is repaired</li> <li>• Consult professional</li> </ul>
Sewage odors— <b>indoors</b>	Toxic gases can cause discomfort and illness.	<ul style="list-style-type: none"> <li>• Sewage surfacing in yard</li> <li>• Improper plumbing</li> <li>• Sewage backup in house</li> <li>• Roof vent pipe clogged or closed</li> </ul>	<ul style="list-style-type: none"> <li>• Repair plumbing</li> <li>• Pump out septic tank and check pumps</li> <li>• Replace water in drain traps</li> </ul>
Sewage odors— <b>outdoors</b>	Major nuisance, Potential health risk	<ul style="list-style-type: none"> <li>• Sewage surfacing in yard</li> <li>• Source other than owner's system</li> </ul>	<ul style="list-style-type: none"> <li>• Pump out septic tank and check pumps</li> <li>• Repair or replace ET/A lines</li> </ul>
Lift station alarm activated	Tank effluent may back up into the house	<ul style="list-style-type: none"> <li>• Pump failed</li> <li>• Fuse breaker tripped</li> <li>• Pump unplugged</li> <li>• Controls malfunctioning</li> </ul>	<ul style="list-style-type: none"> <li>• Check breaker and plugs</li> <li>• Check controls and pump</li> <li>• Make sure professional replaces pump with proper size unit</li> </ul>

