

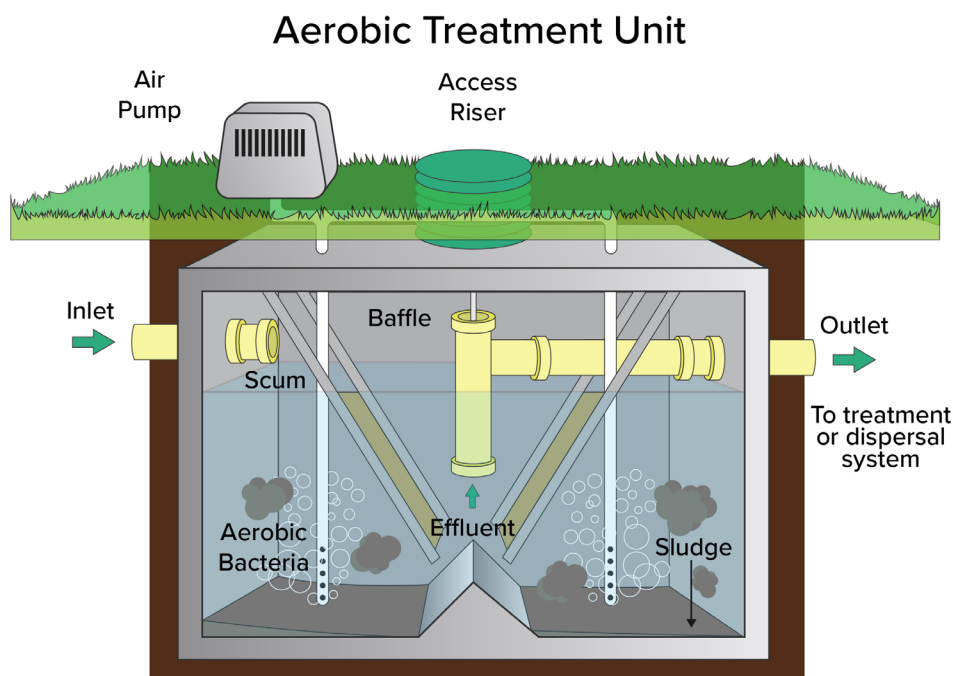
Wastewater Installers

Aerobic Treatment Units Explained

Though conventional systems with septic tanks and absorption fields are the most common decentralized configuration discussed, Louisiana has a unique landscape making traditional units harder to install. Some of the limited conditions include soil saturation, diverse types of soil, elevation of groundwater and proximity to waterways. Due to these conditions, aerobic treatment or mechanical units are more prevalent for installation. Aerobic treatment units (ATUs) will have similar configurations with a pumping

station and chlorine contact chamber before discharge but will operate slightly differently than a conventional system. For larger-scale operations like municipal facilities, processing of waste relies largely on mechanical aeration processes, thus the smaller residential units have the same principle. These systems inject oxygen into the tank to stimulate aerobic bacteria for the treatment of waste. The increase dissolved oxygen creates more suitable conditions for natural biological activity for processing.

How It Works



Please note: The aerobic treatment unit can vary in components and design.

The pretreatment tank is an optional stage that is used to reduce the amount of solids entering the main ATU chamber. This tank will remove material the bacteria will not be able to process and could lead to downstream clogging.

The aeration chamber receives the effluent for treatment using aerobic bacteria. Air bubbles are injected into the chamber stimulating microbial activity and mixing the wastewater as they rise to the top. This chamber consists of an air pump, piping and diffusers that force air into the system. The air pump compresses and drives the air into the aeration chamber. The diffuser forces the air into the water and generates the bubbles that float to the surface.

The clarifier is the final chamber that allows for the treated effluent to settle out. In this chamber, the solids will fall to the bottom of the tank, while the treated wastewater is moved to the next stage.

A chlorine contact chamber is commonly used to disinfect prior to dispersion. This process kills any residual disease-causing microorganisms using stackable chlorine tablets in a force-fed chamber. Homeowners must maintain chlorine contact chambers for the system to efficiently disinfect the wastewater.

Finally, wastewater is distributed through an effluent reduction system to discharge treated wastewater. These systems are customizable based on parish and approval by the state health officer. They will mostly be dependent on local topography, available space, soil profile and water table elevation. For example, there are many cases where ATUs are coupled with pumping stations and chlorine contact chambers for dispersion through spray irrigation systems. This process is almost fully automated and can be set with timer devices to spray at specific time intervals.

Maintaining and Warning Signs for ATUs

During the treatment process, the aerobic bacteria digest both dissolved and solid contaminants into sludge masses, nondegradable floating materials and gases like carbon dioxide. For this to occur, there should be ample oxygen for the microbial communities to thrive and remain active. Some of the common issues that cause problems for ATUs include:

- Solid buildup in the pretreatment tank. This tank needs to be pumped regularly to ensure no backups will occur. It is a best practice to limit food waste that goes through a garbage disposal into your septic unit.
- Solid build-up in the aeration chamber along the bottom of the unit. When the bubbles are on, the aerator will mix the wastewater, and a sample can be collected to see if there is too much suspended sedimentation.
- Reduced air pump flow rate due to a clogged screen, filter or vent. If the air bubbles are not constant, the inlet should be checked for blockage or clog. Any issue with airflow can easily be determined by dissolved oxygen reading. The ideal dissolved oxygen is around 2 mg/L and the tank should not get below 1 mg/L. There are many different commercial kits and dissolved oxygen meters that can be used to test for microbial. If the oxygen is low, this could reduce microbial processing.
- Power outages can cause tanks to fill up and lower the dissolved oxygen needed by the

aerobic bacteria. These types of units should have continuous power sources.

- High water levels from large volumes of water may trigger the automated alarm. The warning may sound due to a clogged distribution head or pipe, a broken pump, excessive water use or broken fixtures.
- The chlorine tablet supply runs out which leads to improper disinfection of effluent. Homeowners must actively monitor chlorine levels using test strips or visual tests to ensure disinfectants reach the correct concentration.

Some indicators for issues may include:

Water Color

In the aeration chamber, the color should look like chocolate milk. If the color is blue or gray/blue then this indicates high concentrations of chemical additives like detergents, antimicrobial soaps or disinfectants.

In the clarifier, the color should be clear. If the water is foamy or sudsy, there may be high concentrations of detergents in the system. You may need to dip a clear glass into the water if you cannot tell while it is in the tank.

If the aeration or clarification chamber has white solid material floating on the top of the water, this can indicate oils or greases in your systems. This can lead to downstream clogging if not cleaned properly.

Neither the aeration nor clarification chamber should have a thick sludge layer. If there is a blanket of sludge, it could be one of the following causes.

- Uneven air bubbling in the system
- Blower failure
- A cracked or broken air line on the unit
- Tank is not level
- Overload of harsh chemicals
- Excessive food scraps or hair passing into aeration tank
- Too much water overloading a smaller-than-needed unit
- Raw sewage spills over to the clarifier from improper seal or too large of pipe

Smell From Unit

This can be caused by:

- Not enough oxygen making it to the system
- High concentrations of chemicals resulting in microbial populations decreasing
- Buildup from sludge or untreated sewage in aeration or clarification chamber

Cases of System Disruption

Though problems can occur for many reasons, here are some specific examples where issues may arise.

- You are about to go to the camp to get prepared for hurricane season and maybe take a little time to do some outdoor activities. You are trying to clear out the refrigerator and use the garbage disposal to get rid of some of the food waste. Abnormal amounts of food scraps can cause increased volumes of sludge and overload bacteria. You are heading to the camp and will be gone for a few days. These food scraps can cause clogs or backups if undigested.
- The time has come to head down to the camp for a weeklong getaway. These recreational camps may only be occupied for a few days out of the month for hunting, fishing or outdoor activities. At these locations, large concentrations of waste are sent to the septic system while you and your family are at the camp, followed by periods of low waste flow. This will drastically reduce the aerobic bacteria in your septic unit. When the next high-flow event occurs, the reduced bacteria will not be able to process the waste as efficiently, thus leading to a longer turnover time for organic materials and the potential for untreated sewage discharge. It has also been a while since you went to the camp. Have you loaded any new chlorine tablets in a while? You didn't write down the last time you refilled the unit and you didn't pick any up at the store. Will your septic effluent be fully disinfected?
- After a few days at the camp, you come home and want to wash multiple loads of laundry and take consecutive showers, which will ultimately cause high volumes of grey water to enter your septic unit. This water will dilute organic material for the bacteria in your residential system and add high concentrations of disinfectant soaps or detergents all at once. This can have adverse effects on microbial processing, especially after filling it full of food waste before your trip.
- A few days later, the Louisiana weather changes, and a storm rolls in knocking out power for a day or two. If the power goes out in your system and water conservation practices have not been utilized before, during or after the storm, your septic system may now be overloaded with water and back up into the house. Once the power is back on, the system should be cycled to make sure the pumps/aerators are operating correctly, effluent is being adequately treated and dispersion is occurring on schedule.

Approved Vendors by Louisiana Department of Health

The list of licensed manufacturers of mechanical treatment plants as of July 2024 can be found below and also at <https://ldh.la.gov/assets/oph/Center-EH/sanitarian/onsitewastewater/LicensedManufacturersofMechanicalTreatmentPlants.pdf>.

- Acquired Wastewater Technology, LLC, 9000 Cook Road, Denham Springs, LA 70726, 800-999-0615, www.modad.com
 - Models: Alliance, Econo HP Dual Air, CajunAire, Mo-Dad, TexAire
- Aerobic Systems Design Inc., 59 Joe Rosier Road, Deville, LA 71328, 318-466-9295
 - Models: Omni Green (G Series)
- AeroGreen Technologies, LLC, 3535 Calder Ave., Suite 310, Beaumont, TX 77706, 409-499-2040
 - Models: AeroGreen (AG series)

- American Wastewater Systems Inc., 1307 South Fieldspan, Duson, LA 70529, 800-960-3997 or 337-873-3128, www.best1systems.com
 - Models: B.E.S.T. 1 AWS
- AquaKlear, Inc., 876 North Bierdeman Road, Pearl, MS 39208, 877-936-7711 or 601-936-7711, www.aquaklear.net
 - Models: AquaKlear (AK, AKA series)
- Bio-Microbics Inc., 16002 W. 110th St., Lenexa, Kansas 66219, 800-753-3278, <https://biomicrobics.com/>
 - Models: Bio-Barrier (MBR), MicroFast
- Clearstream Wastewater Systems Inc., P.O. Box 7568, Beaumont, TX 77726-7568, 409-755-1500, www.clearstreamsystems.com
 - Models: Clearstream
- Ecological Tanks Inc., 2247 Highway 151 North, Downsview, LA 71234, 800-277-8179 or 318-644-0397, www.etiaquasafe.com
 - Models: Aqua Aire (AA series), Aqua Safe (AS and ASO series)
- Enviro-Flo Inc., 235 Flowood Drive, Flowood, MS 39232, 877-836-8476, www.enviro-flo.net
 - Models: Aqua-Flo (AF series), NuWater, BioRobix, Maxx Air, Enviro-Flo (E series)
- Fuji Clean USA LLC, 41-2 Greenwood Road, Brunswick, ME 04011, 207-406-2927, www.fujicleanusa.com
 - Models: Fuji Clean (CE and CEN series)
- Henry McGrew LLC, 3822 East Texas, Bossier City, LA 71111, 318-746-2380
 - Models: JetSpray
- Hoot Aerobic Systems Inc., 2885 Highway 14 East, Lake Charles, LA 70607, 888-878-4668 or 337-474-2804, www.hootsystems.com
 - Models: Hoot (H and LA series)
- Hydro-Action Inc., 2055 Pidco Drive, Plymouth, IN 46563, 800-370-3749 or 574-936-2542, www.hydro-action.com
 - Models: Hydro Action (AN, AP, and CLP series)
- Infiltrator Water Technologies LLC, 9125 Comar Drive, Walker, LA 70785, 225-665-6162, www.infiltratorwater.com/delta-treatment-systems
 - Models: Ecopod (E series), Enviro-Aire (EA series), Whitewater (DF and UC series)
- Jet Inc., 750 Alpha Drive, Cleveland, OH 44143, 440-461-2000, www.jetincorp.com
 - Models: Jet, Nano-Jet
- Montgomery Tanks of LA Inc., 2611 Highway 71, South Montgomery, LA 71454, 318-646-2212
 - Models: Montgomery Tanks (MT series)
- National Wastewater Systems Inc., 137 Reserve Drive, Lake Charles, LA 70611, 337-439-0680, www.solarair.biz
 - Models: Solar Air, Solar Aerobics (SA series)
- Norweco Inc., Firelands Industrial Park, 220 Republic St., Norwalk, OH 44857, 419-668-4471, www.norweco.com
 - Models: Singulair, Hydro-Kinetic
- Orenco Systems Inc., 814 Airway Ave., Sutherlin, OR 97479, 800-348-9843 or 541-459-4449, www.orenco.com
 - Models: AdvanTex (AX series)
- SludgeHammer, 4772 US-131 South Building D., Petoskey, MI 49770, 231-348-5866, <https://sludgehammer.net/>
 - Models: SludgeHammer
- Toshco Sewer Systems Inc., 2460 Comeaux Road, Jennings, LA 70546, 337-855-2282, www.microair-atu.com
 - Models: Micro Air

References

- <https://ldh.la.gov/assets/oph/Center-EH/sanitarian/onsitewastewater/VISUALCHECLIST.pdf>
- <https://ldh.la.gov/assets/oph/Center-EH/sanitarian/onsitewastewater/HomeATUBrochure.pdf>
- <https://ldh.la.gov/assets/oph/CenterEH/sanitarian/onsitewastewater/TROUBLESHOOTINGGUIDFOMECHANICALPLANTS.pdf>

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