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L-5475
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Onsite wastewater treatment systems

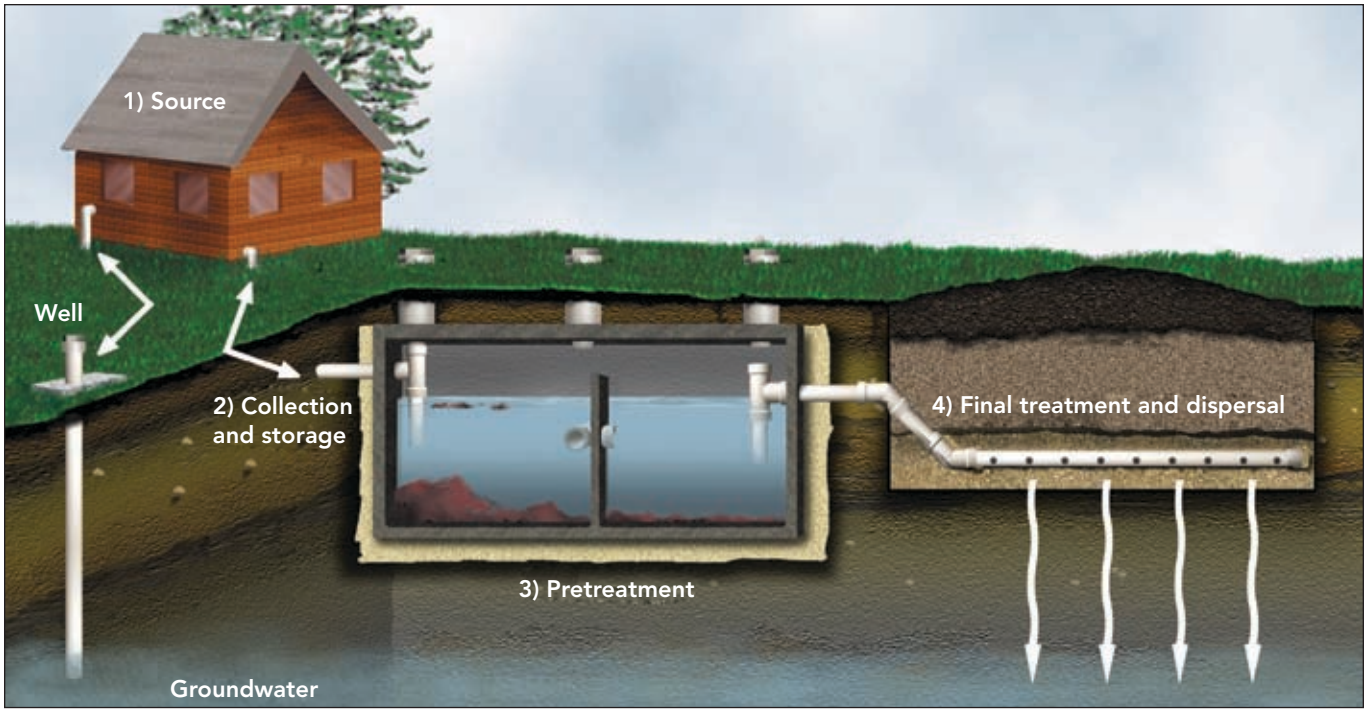

Figure 1: Components of an onsite wastewater treatment system.

Responding to power outages and floods

Bruce Lesikar, Courtney O'Neill and David Smith
Professor and Extension Agricultural Engineer, Extension Assistant and Extension Assistant
The Texas A&M System

Electrical power outages and floods can affect a home's onsite wastewater treatment system. Onsite wastewater treatment systems remove organic matter, solids and living organisms (viruses, bacteria, and protozoa from wastewater. If a wastewater treatment system stops working properly, it can result in harm to people and the environment.

The appropriate response to a disaster depends upon the type of disaster and the type of treatment unit at your home. To properly respond, homeowners need to know the components of their on-site wastewater treatment systems as well as the steps to take after a power outage or flood.

Components

Onsite wastewater treatment systems can be divided into four components: 1) wastewater source or use, 2) wastewater collection and storage, 3) pretreatment, and 4) final treatment and dispersal.

The wastewater source or use is the home or a business that the wastewater treatment system is serving.

The wastewater collection system is generally the plumbing that conveys the wastewater from the source to the pretreatment component. Most collection components are constructed of piping with an access port placed on a slope to allow gravity to move the waste and water to the pretreatment component.

However, some collection components have a pump tank and pump placed in the plumbing network to collect wastewater from the source and then pump the wastewater to the pretreatment components.

The pretreatment component varies with site conditions and the type of final treatment and dispersal component installed. Pretreatment components include septic tanks, aerobic treatment units, media filters, constructed wetlands, and/or disinfection units.

The pretreatment component removes contaminants from the wastewater to obtain an effluent (outflow) that can be accepted and treated by the final treatment and dispersal component.

The final treatment and dispersal component completes the treatment process and disperses the effluent into the receiving environment. Final treatment and dispersal components include media-filled trenches, gravelless trench technology, low-pressure pipe drain fields, drip distribution fields, and spray distribution fields.

For more information on these technologies, visit the Onsite Wastewater Treatment & Reuse Web site at http://ossf.tamu.edu.

Electrical outages

The most common cause for an interruption of service for an onsite wastewater treatment system is an electrical outage. The appropriate response depends on the type of pretreatment and final treatment and dispersal components of your onsite wastewater treatment system.

A gravity collection system feeding into a septic tank and gravity distribution soil absorption area will continue to operate properly, and you will be able to continue using your system.

However, if your system contains electrical components, the wastewater will collect in the system during the electrical outage, and it will have to be treated and dispersed after electrical service resumes.

Onsite wastewater treatment components that use electricity include:

- ✔ Aerobic treatment units
- ✔ Sand filters
- ✔ Recirculating media filters
- ✔ Flow equalization tanks
- ✔ Low pressure distribution
- ✔ Subsurface drip distribution
- ✔ Spray distribution

These components usually have a reserve or alarm capacity that allows some water usage during electrical power outages or when the components break. However, that reserve is small.

For example: In Texas, an onsite wastewater treatment system serving a three-bedroom house is required to be able to treat at least 240 gallons of wastewater a day. State regulations stipulate that a system requiring electricity must have minimum reserve capacity of one-third the amount of wastewater that the system was designed to treat in a day. Thus, an onsite wastewater treatment system for a three-bedroom residence must have a reserve capacity of 80 gallons.

In a typical shower, 2.5 gallons are used per minute, so one 10-minute shower would send 25 gallons to the wastewater treatment system. Toilets use from 1.6 to 2.5 gallons per flush. A reserve capacity of 80 gallons would allow very little emergency water usage per day.

If your system has electrically operated components and the power goes out:

- ✔ Limit your water usage to essentials such as toilet flushing and hand washing. Minimize or eliminate laundry, bathing, showering, and dishwashing.
- ✔ Stop all water use if the electrical outage is extended or the plumbing begins to drain slowly. Slow-draining plumbing may indicate that the reserve capacity is exceeded and the system is full.

Once power is restored:

- ✔ Limit laundry and dishwashing if your system has an advanced pretreatment component and the power outage is less than 1 day. If the power outage is longer than a day, discontinue these activities for a day, and limit shower time and bathwater volume for at least 1 day. This period allows the microorganisms that treat the wastewater to begin working again and properly treat the wastewater.
- ✔ Allow the system to continue to operate normally until the water level drops to the normal operating level in the system. A time-dosed system may take 24 hours to have all the stored water distributed and the high-water alarm deactivated.
- ✔ System components that require electricity are usually equipped with a high-water alarm. When the power is restored, this alarm may sound, depending on your water usage during the power outage. You can silence the alarm if it has a silence switch option. Contact your service provider if the alarm remains activated for more than 24 hours.
- ✔ If your final treatment and dispersal component has an on-demand pumping system (that is, if it is a low-pressure or subsurface drip distribution system), you may need to manually control the length of time that the treated wastewater is delivered to the dispersal field immediately after the outage, to prevent flooding of the field. Otherwise, the first dose after the power is restored can overload your system, and untreated wastewater could flow onto your lawn.
- ✔ If the power outage lasted less than a day and you minimized water usage during the outage, your system will probably recover by itself. However, if the power was out for more than a day, check your system design information to find out the usual dosage and rest times. After the power outage, allow the pump to operate for its usual dosage time, then turn the power off by flipping the breaker. Wait for the specified rest period, then allow another dosage for the usual amount of time. Continue this pattern until the pump turns off

by itself after its normal dosage time.

- ✔ An alternative is to ask your service provider for instructions on how your system should be brought back into operation after a power outage.
- ✔ If your system's final treatment and dispersal component is a spray distribution system, and the power outage was longer than 1 day, the effluent being distributed on the ground surface may not be treated to its normal expected quality. You should make sure the disinfection treatment component is working correctly, and limit activity in the distribution area while the ground and grass are moist after the treated wastewater is sprayed there.

Flooding

In a flood, an onsite wastewater treatment system may become inundated with surface water. The extent of the flooding's effect on the system will be related to the amount of water flooding over the system and the length of time the system is flooded.

During a flood:

- ✔ Discontinue electrical power to the system by turning the power off at the main circuit panel.
- ✔ Stop water usage going into the system because it may not receive much treatment.
- ✔ To prevent water from backing up through the system and into the home, plug any floor drains in the home connected to the wastewater treatment system.

After a flood:

- ✔ Do not use the system until the floodwater has receded from all components of the system.
- ✔ Inspect the system for any signs of damage to its surface, such as damaged lids or inspection ports, or exposed components because soil has washed away.
- ✔ If the system components are filled with floodwater, call a service provider to check the system for sediment or other debris. Some water may be removed from the pretreatment components to reduce the water level to the normal operating level. Do not pump the tanks empty or below their normal operating level because the ground will usually be saturated after flooding. Empty tanks are buoyant and will tend to float out of the ground. This upward force can make the tanks shift, which could damage the piping or even cause the tanks to float to the ground surface.
- ✔ If your final treatment and dispersal component is a trench system and it has inspection ports, the service provider may be able to pump water from the trenches to help the soil dry and aerate.
- ✔ If the onsite wastewater treatment system has components requiring electrical power, the ability to restart the system depends on the flood elevation. If the floodwater covered only the tanks and the components in the tanks, the system may be able to be restarted without further evaluation of the components. If the floodwater covered the components located on the ground surface (such as air pumps or panels), have the system inspected by a service provider to determine the condition of the components before using the system and restarting electrical service.
- ✔ If your system's final treatment and dispersal component is a spray distribution system, the effluent being distributed on the ground surface may not be treated to its normal expected quality. The microbes (microorganisms) providing the treatment need a day or two to recover and provide proper treatment. Make sure the disinfection treatment component is working correctly, and limit activity in the distribution area while the ground and grass are moist after a spray distribution event.

Summary

Electrical power outages and floods can affect your wastewater system. During and after these events, wastewater treatment can be limited and can pose health concerns and hazards if not managed appropriately.

Know the components of your onsite wastewater treatment system and the proper response after a flood or power outage.

This publication was funded by the Rio Grande Basin Initiative administered by the Texas Water Resources Institute of the Texas AgriLife Extension Service, with funds provided through a grant from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 2005-45049-03209.

The Onsite Wastewater Treatment Systems series of publications is a result of collaborative efforts of various agencies, organizations and funding sources. We would like to acknowledge the following collaborators:

Texas State Soil and Water Conservation Board	USEPA 319(h) Program
Texas On-Site Wastewater Treatment Research Council	Texas AgriLife Extension Service
Texas Commission on Environmental Quality	Texas AgriLife Research
Consortium of Institutes for Decentralized Wastewater Treatment	USDA Natural Resources Conservation Service

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Produced by AgriLife Communications, The Texas A&M System

Extension publications can be found on the Web at: http://AgriLifeBookstore.org.

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward G. Smith, Director, Texas AgriLife Extension Service, The Texas A&M University System.
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