WATER QUALITY
UTAH STATE UNIVERSITY EXTENSION

How to Manage Your Septic System and Protect Your Water

Fact Sheet 6
WQFA-12

INSIDE:

EXTENSION
Utah State University

Many homeowners in Utah treat household wastewater with a septic tank system. Proper installation and maintenance of these systems can protect your family from possible health impacts, reduce the need for expensive repairs, and protect water resources.

Although Utah law specifies how wastewater systems should be designed and installed, local requirements vary throughout the state. When installing a new system, or to assure that your existing system meets local requirements, check with the local health department. At a minimum, you must follow the codes established by the state. Please take the time to consider whether these minimum requirements are satisfactory for your site.

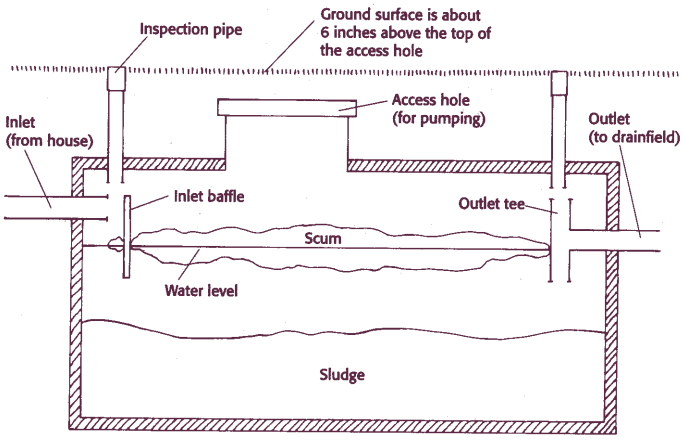
For additional information or reading materials, refer to contacts and references section at the end of this fact sheet.

SEPTIC TANK/SOIL ABSORPTION SYSTEM

The most common form of on-site wastewater treatment is a septic tank / soil absorption system. Wastewater is collected throughout your home and flows from the household sewer to the septic tank, where the waste is partially treated. The waste then moves on to a soil absorption field where the final stages of wastewater treatment occur. Both of these components of your system are important and need to be maintained properly to avoid system failures, contamination of water and increased risk to your family's health.

Pre-treatment in the Septic Tank

Septic tanks retain most of the suspended solids from wastewater. The heavier solids (sludge) settle to the bottom and the grease and fatty solids (scum) float to the top. In the tank, bacteria digest and compact the sludge. Baffles in the tank provide maximum retention of solids, prevent inlet and outlet plugging and stop rapid flow of wastewater through the tank. The partially treated water moves on to the soil absorption field for treatment and disposal.



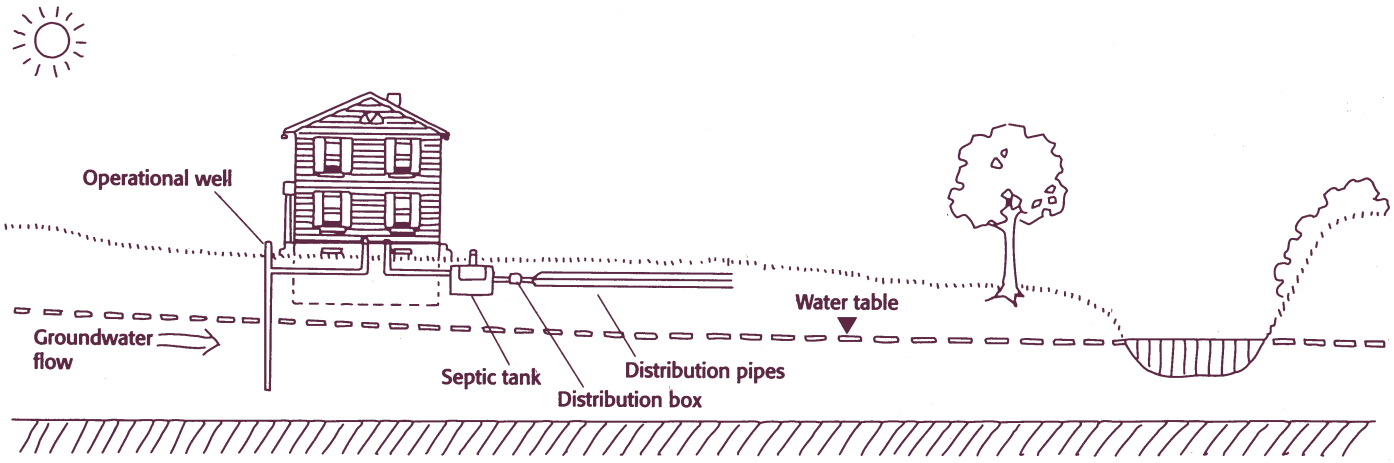
Tanks should be sized according to county health department standards. The minimum size in Utah is 1000 gallons.

Subsurface Treatment in a Soil Absorption Field (Drainfield)

The liquid portion (effluent) flows through an outlet in the septic tank to the soil absorption field. The most common absorption field consists of trenches installed below the ground surface. These trenches are filled with gravel and a perforated pipe, or with plastic perforated chambers. The liquid (effluent) leaks out through holes in the pipe or plastic chambers, then down through the drain field gravel or rock into the soil. The soil filters out remaining solids and causes pathogens (disease-producing microorganisms) to die off. Dissolved substances slowly percolate through the soil, where they are broken down by oxygen-requiring microorganisms. Plant roots take up the wastewater and nutrients.

Alternate Treatment Systems

Some systems such as **at-grade** and **mound systems** are considered "alternate systems" by Utah and are NOT approved in many counties. Check with your local health department to determine if these are allowed in your area.



MANAGING YOUR SYSTEM

Managing the Collection Component

Don't allow water that doesn't need treatment (basement floor drain sumps, foundation drains, infiltration of rain water and roof drainage) to add to your waste volume. Leaky piping or infiltration of clear water can overload the system and dilute the waste. Divert clear water that doesn't require treatment away from house, well and wastewater treatment systems.

Managing the Septic Tank Component

Treatment of waste in the septic system depends on bacterial action. Do not "shock" your system by putting toxic substances such as pesticides or solvents down your drains. Do not overload your tank with materials that will clog it, such as paper products, fats and grease, or coffee grounds. (For more information, see the "Improving Wastewater Quality" section in this fact sheet).

A properly managed septic tank does not need chemicals or other additives to "clean" the system. These may interfere with the biological action in the tank and may result in clogging your soil absorption field.

Pump the tank before it is more than one-third full (generally every three to five years) to improve functioning of the system. When the tank is pumped make sure the baffles are in good condition and the tank is not leaking. Sludge pumped from septic tanks must be disposed of by a licensed tank pumper at an approved location. If liquids are pumped, they must be taken by a licensed pumper to a wastewater treatment facility. No surface application of liquids is allowed on homeowner's or farmstead property.

Managing the Soil Absorption Field

Avoid activities that will compact your soil absorption field. Do not drive or park over this area, and keep livestock away from the area. Do not plant large trees near the drainfield as the roots may disrupt the system. Do not add additives intended to "clean" the system, as these may lead to clogging the absorption field.

A minimum of two feet of permeable unsaturated soil is needed for removal of harmful contaminants. The best soils, such as silt loam or loam, hold wastewater long enough for treatment to occur but do not plug up or create system backups or pooling.

When wastewater is properly incorporated into surface soil, the chance of runoff or movement of untreated water to groundwater is reduced. To protect groundwater, soil absorption fields should be at least 100 feet and downslope from any wells.

Your health department or a professional installer can assist you in evaluating your soils.

Minimize the Volume of Household Wastewater

The best way to manage your septic system is to minimize the volume of household wastewater you produce. Reducing wastewater volume improves treatment by increasing the time the waste spends in the system, which gives the waste more time for settling, separation and soil contact. Lower volumes of wastewater also mean longer system life and less chance of overflow.

Average water use in rural households is 40-75 gallons per person per day. With low-use fixtures and individual awareness water use can be reduced to fewer than 25 gallons per person per day.

Modify Personal and Household Habits to Reduce Wastewater Volume

Fostering an awareness of your family's water use habits can be as important in reducing water use as installing water conservation devices.

It is usually possible to modify personal and household habits to reduce wastewater volume. For example, encourage your family to take shorter showers, or even try "wet down, soap up without water, then rinse" showers. Turn off water between uses and when brushing teeth.

Do not dispose of tissues or other similar solid wastes by flushing them down the toilet. Never do more than two loads of laundry per day. Always use a suds saver and run full loads. When running small loads, be sure to use the reduced water level setting.

TAKE ACTION!

Eliminate unnecessary water from entering your system

- Fix plumbing leaks.
- Eliminate sources of clear water and infiltration into the system. For example, divert roof drains away from the soil absorption field.
- Adjust the timing of your water softener recharging mechanisms to reduce excessive water use.

Upgrade Fixtures

Replace conventional plumbing fixtures with more efficient fixtures and water saving devices to reduce home water use by 30 to 70 percent. See the table below for savings possible with these fixtures.

WATER USE BY CONVENTIONAL AND WATER-SAVING FIXTURES/DEVICES

Conventional fixture	Gallons used	Water-saving fixture / device	Gallons used
Toilet	4-6 / flush	Air-assisted toilet	0.5 / flush
Showerhead	4-6 / min	Low-flow shower head	2 / min
Faucets: Bathroom Kitchen	 4-6 / min 4-6 / min	Faucet flow control aerators: Bathroom Kitchen	 0.5 / min 1.5 / min
Top-loading clothes washer	40-55 / load	Front-loading clothes washer	22-33 / load

Source: Penn State Cooperative Extension Circular 302.

IMPROVE THE QUALITY OF WASTEWATER

Water that leaves your absorption system can move into groundwater or seep into surface waters. Although wastewater is more than "99.44 percent pure" water, the contaminants it contains can cause serious health problems or may cause environmental problems.

Contaminants found in wastewater include:

• **Bacteria and viruses** are microorganisms that are large enough to be removed by settling or through filtration in beds or soil. Some of these can cause disease.

• **Suspended solids** are particles that are more dense (sludge) or less dense (scum) than water. Most of these solids can settle out in a calm septic tank. Greases and fats are a part of these suspended solids. Soil absorption systems can be clogged by wastewater high in suspended solids.

• **Organic solvents** from cleaning agents and fuels may not be degraded or removed through treatment and can pass along with the wastewater back into the groundwater.

• **Nutrients** such as nitrogen and phosphorus can contaminate ground or surface water. Nitrate-nitrogen, in particular, cannot be removed by the soil absorption field. High concentrations of nitrate in drinking water can cause blue-baby syndrome.

TAKE ACTION!

- Minimize use of garbage disposal unit.
- Do not put items in drains that could clog septic tanks or drainfields.
- Do not put toxic substances in drains.
- Do not use chemicals or other additives to "clean" your system.

To improve wastewater quality, do not overload your septic system because this will lead to incomplete treatment or clogging. Also, do not put hazardous or toxic materials into your system,because these chemicals may reduce the effectiveness of the system and may also move on into ground or surface waters.

• Minimize the use of your garbage disposal unit. Garbage disposal use contributes a large load of suspended solids and organic materials to wastewater, as well as uses additional water.

• Do not put items in drains that may clog septic tanks or drainfields (i.e. fats, grease, coffee grounds, paper towels, sanitary products, disposable diapers, powder detergents, or large amounts of milk.)

• Do not put toxic substances in drains that might end up in the groundwater, such as solvents, degreasers, acids, oils, paints, disinfectants and pesticides. (This does not include using bleach to disinfect laundry or washing clothing worn for pesticide applications.)

• Do not use chemicals or other additives to "clean" your system. They may interfere with the biological action in the tank. They can clog the drainfield by flushing sludge and scum into it, or add toxic chemicals to ground water.

ASSISTANCE WITH FAILING SYSTEMS OR NEW DESIGNS

If you suspect your household wastewater treatment system is backed up or the distribution system is clogged, contact your plumber or treatment system installer. They may have suggestions for extending the life of your system.

Do not place more soil over a soil absorption field that is surfacing (wastewater is reaching the surface). This does not fix the system and wastewater will soon resurface. **Never** pipe the sewage to the road ditch, storm sewer, stream or farm drain tile and never run the sewage into a sink hole or drainage well.

These actions pollute the water, create a health hazard and violate health codes.

The local health department can provide assistance and additional contacts of qualified individuals to repair or replace your system. Your local health department can also tell you whether financial assistance is available for low income homeowners to help repair their systems.

A properly designed, constructed and maintained septic system can effectively treat wastewater for many years. For more information on septic systems, contact your Utah State University county Extension agent or local health department.

CONTACTS AND REFERENCES

HOUSEHOLD WASTEWATER TREATMENT REGULATIONS

COUNTY HEALTH DEPARTMENTS:

Beaver County	(435) 387-2671	Piute County	(435) 577-2521
Box Elder County	(435) 734-0845	Rich County	(435) 752-3730
Cache County	(435) 752-3730	Salt Lake County	(801) 963-7300
Carbon County	(435) 637-3671	San Juan County	(435) 678-2723
Daggett County	(435) 784-3494	Sanpete County	(435) 835-2231
Davis County	(801) 451-3315	Sevier County	(435) 896-5451
Duchesne County	(435) 738-2202	Summit County	(435)615-3910
Emery County	(435) 381-2252	Tooele County	(435) 843-2310
Garfield County	(435) 676-8800	Uintah County	(435) 781-5475
Grand County	(435) 259-5602	Utah County	(801) 370-8738
Iron County	(435) 826-4397	Washington County	(435) 644-2537
Juab County	(435) 623-0696	Wasatch County	(435) 654-2700
Kane County	(435) 586-2437	Wayne County	(435) 836-2671
Millard County	(435) 864-3612	Weber County	(801) 399-8854

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY:

Division of Water Quality: (801) 538-6146 or on the web at http://waterquality.utah.gov

SMALL AND ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

National Environmental Services Center, National Small Flows Clearinghouse, West Virginia University,
P.O. Box 6064, Morgantown, WV 26506-606: (800) 624-8301 or (304) 293-4191 or on the web at:
http://www.nesc.wvu.edu/nsfc/nsfc_index.htm.

UTAH ON-SITE WASTEWATER TREATMENT TRAINING:

(435) 797-3230 (Judith Sims: jlsims@cc.usu.edu)
or on the web at: http://www.engineering.usu.edu/uwrl/training.

HOUSEHOLD FIXTURES AND WATER CONSERVATION:

For information on water conservation: www.waterinfo.org.

EARTHEASY:

For information on low flow aerators for your showerhead: on the web at http://eartheasy.com/live_lowflow_aerators.htm.

FOR INFORMATION ON COMPOSTING TOILETS:

http://www.compostingtoilet.org/
http://oikos.com/library/compostingtoilet/

MORE READING:

Design Manual: On-site Wastewater Treatment and Disposal Systems (1980) EPA 625/1-80-012, http://www.epa.gov/ORD/NRMRL/Pubs/625180012/625180012.htm.

Home Water Treatment, Code NRAES-48
MidWest Plan Service: (800) 562-3618 or (515) 294-4337 or http://www.bae.umn.edu/extens/mwps/orderform.html

"How To Save Water," Consumer Reports, July 1990, pages 465-473.

On-site Domestic Sewage Disposal Handbook. https://www.mwpshq.org/catalog.html under the "Home" section.

University of Minnesota Extension Service Publications:

* Taking Care of Your Septic System
* Alternative Septic Systems
* Water: How Septic Systems Work
* Septic System Owners Guide
* Understanding Your Septic System

http://www.extension.umn.edu/topics (look under "septic systems.")

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GLOSSARY

These terms may help clarify some terms used in this Fact Sheet and may also help you make more accurate assessments when completing the Utah Farmstead Assessment for Ground Water and Surface Water Protection Survey 4 (Landowner's Survey: What's the Risk to Your Water from Your Septic System?)

APPROVED DISPOSAL SITE (FOR WASTEWATER): A site for land application of wastewater or septic tank pumpage that meets state standards and which is approved by the Utah Department of Environmental Quality.

CESSPOOL: Covered excavation in the ground that receives sewage directly from a building's sanitary drainage system. It is designed to retain the organic matter and solids and permit liquid to seep into soil cavities. Cesspools do not provide effective removal of solids and use is not permitted.

CLEAR WATER INFILTRATION: Entry to water that does not need treatment, such as rainfall or tile drainage, into a system through unsealed joints, access ports and cracks.

DESIGN CAPACITY: Maximum volume of liquid that can be treated in a particular waste water treatment system. For systems that include subsurface wastewater disposal and distribution, capacity is also based on the soil's ability to accept and treat sewage effluent. In filling out this worksheet, if you don't know the design capacity of your system, use 150 gallons per bedroom per day as an estimate.

DRAINFIELD: Consists of long underground perforated pipes or tiles connected to the septic tank. Liquid waste or effluent flows out of the tank and is evenly distributed into the soil through the piping system. The soil below the drain-field provides the final treatment and disposal of the septic tank effluent

EFFLUENT: Liquid discharged from a septic tank or other treatment tank.

SCUM: Float-able solids, such as grease and fat.

SEPTIC TANK: A sewage-disposal tank in which a continuous flow of waste material is decomposed by anaerobic bacteria.

SLUDGE: Settleable, partially decomposed solids resulting from biological, chemical or physical wastewater treatment.

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