

**SUNOL WASTEWATER FEASIBILITY STUDY
SANITARY SURVEY QUESTIONNAIRE
(Residential)**

Instructions: Please submit completed form to Questa Engineering at Box 70356, Richmond CA 94807. Separate forms should be used for each parcel you own.

Property Information

1. In what part of Sunol is your property located? (See Figure 1)

- ☐ 1. Downtown Sunol
- ☐ 2. Killkare Road – Middle Reach
- ☐ 3. Killkare Woods – West Side
- ☐ 4. Killkare Woods – East Side

2. How many buildings on the property?

3. How many buildings have plumbing drains (sinks, toilets, floor drains)?

4. How many total bedrooms?

5. How many residents?

Full time: _____ Part time: _____

6. In the list below, check the type of onsite wastewater treatment system (OWTS) components on the property, along with your best estimate of how old each component is. See attachment for definition of terms and notes.

- ☐ Septic Tank age _____
- ☐ Leachfield age _____
- ☐ Seepage Pit age _____
- ☐ Pump System age _____
- ☐ Cesspool age _____
- ☐ Holding Tank age _____
- ☐ Unknown
- ☐ Other (describe): _____

7. How is greywater (laundry, showers, bathroom sinks) disposed of?

- ☐ Into septic tank
- ☐ Directly to leachfield
- ☐ Separate greywater system
- ☐ Onto ground surface.
- ☐ Unknown
- ☐ Other (describe): _____

8. How often is the septic tank pumped?

- ☐ More than once a year
- ☐ Once a year
- ☐ Every 2 to 5 years
- ☐ Less frequently
- ☐ Never

9. Approximately when was the septic tank last pumped (month & year):

SUNOL WASTEWATER FEASIBILITY STUDY SANITARY SURVEY QUESTIONNAIRE (Residential)

10. Have any of the following problems been observed with the current OWTs (check as applicable)?

- A: ☐ slow drainage of plumbing fixtures or backup into house:
☐ year-round
☐ seasonal
☐ after heavy rainfall
☐ occasional for unexplained reason
- B: ☐ wet or noticeably damp soil in leachfield area and/or odors:
☐ year-round
☐ seasonal
☐ after heavy rainfall
☐ occasional for unexplained reason
- C: ☐ visible liquid on ground surface within or near septic tank or leachfield area:
☐ year-round
☐ seasonal
☐ after heavy rainfall
☐ occasional for unexplained reason

11. Has OWTS ever been inspected formally, such as for property improvements, financing, etc?

___ Yes or ___ No; when (date) _____

12. If the OWTS has been repaired provide the date of the repair, the nature of the problem, type of repair work performed, and whether or not the repair resolved the problem.

Year	Problem	Repair Work	Did Repair Fix Problem?
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

13. Other Comments

[illegible]

HOW TO OPERATE AND MAINTAIN YOUR ONSITE WASTEWATER TREATMENT (OR SEPTIC) SYSTEM

TUESDAY, JULY 10, 2018 6-9 PM

SUNOL GLEN SCHOOL AUDITORIUM

What is wastewater and why do we care if it is properly treated and disposed of

Overview of Onsite Wastewater Treatment Systems (OWTS)

- Standard systems, advanced systems, cesspools, seepage pits, graywater systems, composting toilets, others
- What are the differences and how do they work
- What type of system is right for my property

OWTS Maintenance and Operation

- Septic tanks and pumping
- Treatment units
- Dispersal systems (or leachfields)
- Impact of ejector pumps, garbage disposals, water purification systems, leaking toilets and faucets, trees, patios, water saving fixtures, and greywater systems
- Who do I call to evaluate my OWTS, make repairs or pump my tank
- Maintaining operating records

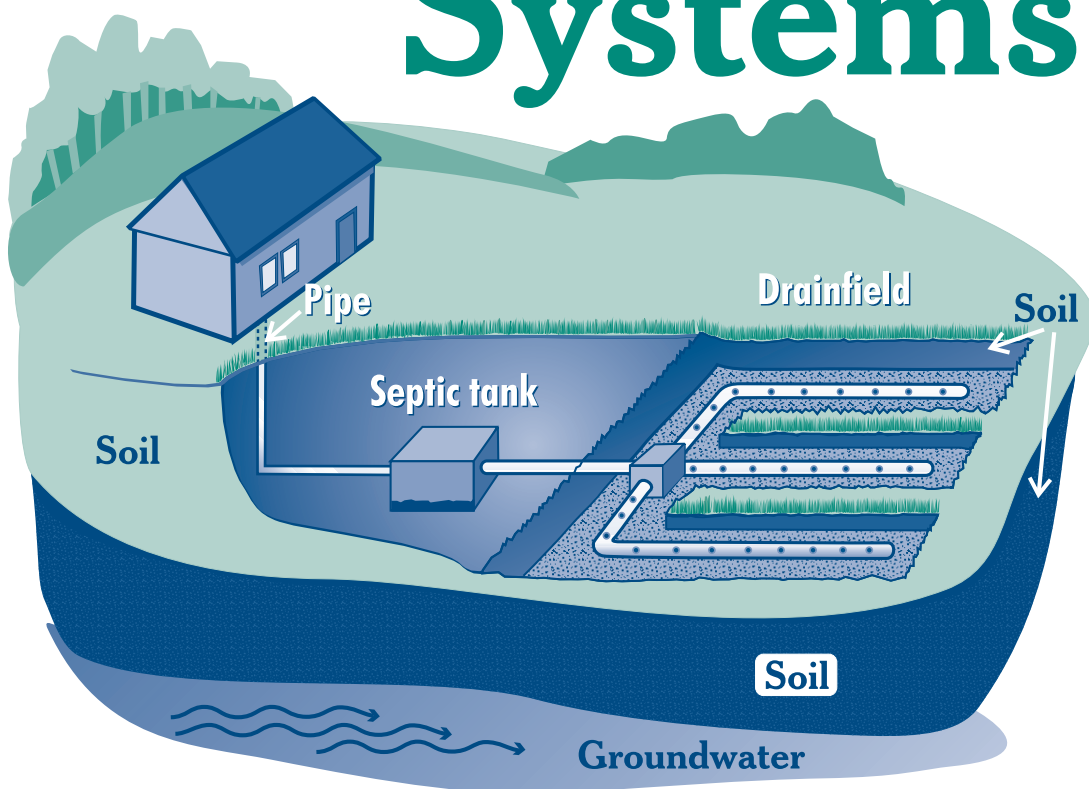
Typical failures of OWTS

- How to identify problems early; what to do if your system shows signs of problems

Reporting Requirements for Homeowners

- Standard OWTS (5-year reporting)
- Advanced OWTS (annual operating permit, inspection and reporting)

A Homeowner's Guide to Septic Systems



What’s Inside

Your septic system is your responsibility 1

How does it work? 1

Why should I maintain my septic system? 4

How do I maintain my septic system? 5

What can make my system fail? 9

For more information 13

Your Septic System is your responsibility!

Did you know that as a homeowner you're responsible for maintaining your septic system? Did you know that maintaining your septic system protects your investment in your home? Did you know that you should periodically inspect your system and pump out your septic tank?

If properly designed, constructed and maintained, your septic system can provide long-term, effective treatment of household wastewater. If your septic system isn't maintained, you might need to replace it, costing you thousands of dollars. A malfunctioning system can contaminate groundwater that might be a source of drinking water. And if you sell your home, your septic system must be in good working order.

This guide will help you care for your septic system. It will help you understand how your system works and what steps you can take as a homeowner to ensure your system will work properly. To help you learn more, consult the resources listed at the back of this booklet. A helpful checklist is also included at the end of the booklet to help you keep track of your septic system maintenance.

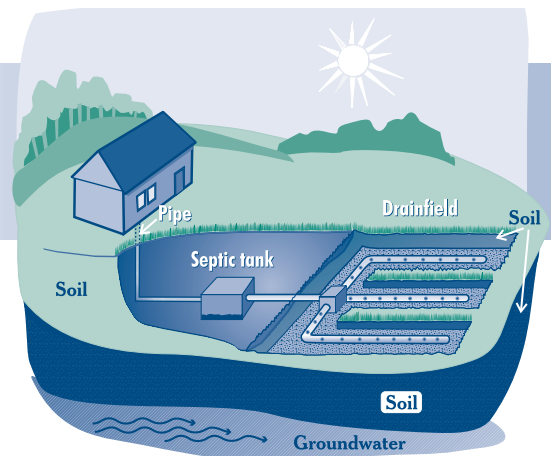
Top Four Things You Can Do to Protect Your Septic System

1. **Inspect your system (every 3 years) and pump your tank as necessary (generally every 3 to 5 years).**
2. **Use water efficiently.**
3. **Don't dispose of household hazardous wastes in sinks or toilets.**
4. **Care for your drainfield.**

How does it work?

Components

A typical septic system has four main components: a pipe from the home, a septic tank, a drainfield, and the soil. Microbes in the soil digest or remove most contaminants from wastewater before it eventually reaches groundwater.



Typical onsite wastewater treatment system

Septic system aliases:

- On-lot system
- Onsite system
- Individual sewage disposal system
- Onsite sewage disposal system
- Onsite wastewater treatment system

Pipe from the home

All of your household wastewater exits your home through a pipe to the septic tank.

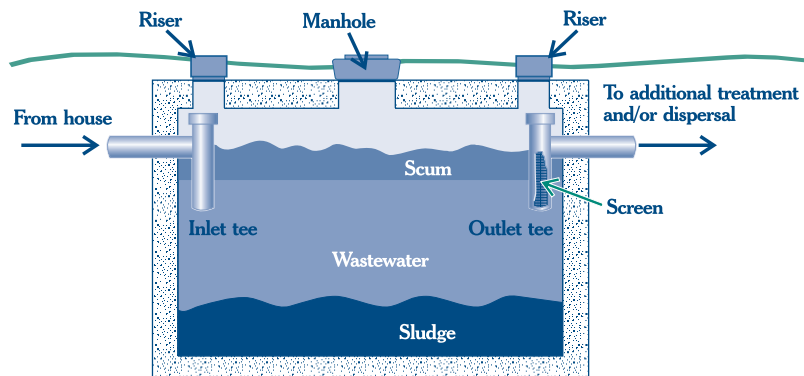
Septic tank

The septic tank is a buried, watertight container typically made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow solids to settle out (forming sludge) and oil and grease to float to the surface (as scum). It also allows partial decomposition of the solid materials. Compartments and a T-shaped outlet in the

septic tank prevent the sludge and scum from leaving the tank and traveling into the drainfield area. Screens are also recommended to keep solids from entering the drainfield.

Newer tanks generally have risers with lids at the ground surface to allow easy location, inspection, and pumping of the tank.

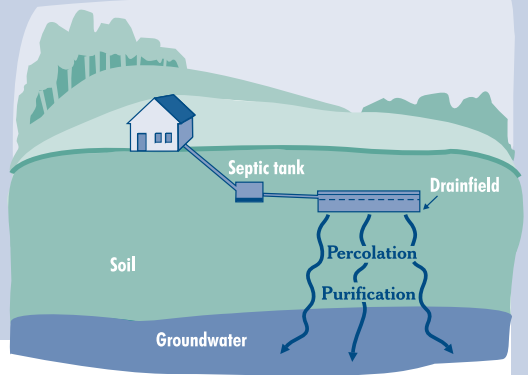
Typical single-compartment septic tank with ground-level inspection risers and screen



Tip To prevent buildup, sludge and floating scum need to be removed through periodic pumping of the septic tank. Regular inspections and pumping as necessary (generally every 3 to 5 years) are the best and cheapest way to keep your septic system in good working order.

Finding Your System

Your septic tank, drainfield, and reserve drainfield should be clearly designated on the “as-built” drawing for your home. (An “as-built” drawing is a line drawing that accurately portrays the buildings on your property and is usually filed in your local land records.) You might also see lids or manhole covers for your septic tank. Older tanks are often hard to find because there are no visible parts. An inspector/pumper can help you locate your septic system if your septic tank has no risers.



Drainfield

The wastewater exits the septic tank and is discharged into the drainfield for further treatment by the soil. The partially treated wastewater is pushed along into the drainfield for further treatment every time new wastewater enters the tank.

If the drainfield is overloaded with too much liquid, it will flood, causing sewage to flow to the ground surface or create backups in plumbing fixtures and prevent treatment of all wastewater.

A reserve drainfield, required by many states, is an area on your property suitable for a new drainfield system if your current drainfield fails. Treat this area with the same care as your septic system.

Soil

Septic tank wastewater flows to the drainfield, where it percolates into the soil, which provides final treatment by removing harmful bacteria, viruses, and nutrients. Suitable soil is necessary for successful wastewater treatment.

Alternative systems

Because many areas don't have soils suitable for typical septic systems, you might have or need an alternative system. You might also have or need an alternative system if there are too many typical septic systems in one area or the systems are too close to groundwater or surface waters. Alternative septic

systems use new technology to improve treatment processes and might need special care and maintenance. Some alternative systems use sand, peat, or plastic media instead of soil to promote wastewater treatment. Other systems might use wetlands, lagoons, aerators, or disinfection devices. Float switches, pumps, and other electrical or mechanical components are often used in alternative systems. Alternative systems should be inspected annually. Check with your local health department or installer for more information on operation and maintenance needs if you have or need an alternative system.

Why should I maintain my septic system?

When septic systems are properly designed, constructed, and maintained, they effectively reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater. However, they require regular maintenance or they can fail. Septic systems need to be monitored to ensure that they work properly throughout their service lives.

Saving money

A key reason to maintain your septic system is to save money! Failing septic systems are expensive to repair or replace, and poor maintenance is often the culprit. Having your septic system inspected regularly (at least every 3 years) is a bargain when you consider the cost of replacing the entire system. Your system will need pumping (generally every 3 to 5 years), depending on how many people live in the house and the size of the system. An unusable septic system or one in disrepair will lower your property value and could pose a legal liability.

Protecting health and the environment

Other good reasons for safe treatment of sewage include preventing the spread of infection and disease and protecting water resources. Typical pollutants in household wastewater are nitrogen, phosphorus, and disease-

causing bacteria and viruses. If a septic system is working properly, it will effectively remove most of these pollutants.

With one-fourth of U.S. homes using septic systems, more than 4 billion gallons of wastewater per day is dispersed below the ground's surface. Inadequately treated sewage from septic systems can be a cause of groundwater contamination. It poses a significant threat to drinking water and human health because it can contaminate drinking water wells and cause diseases and infections in people and animals. Improperly treated sewage that contaminates nearby surface waters also increases the chance of swimmers contracting a variety of infectious diseases. These range from eye and ear infections to acute gastrointestinal illness and diseases like hepatitis.

How do I maintain my septic system?

Inspect and pump frequently

You should have your septic system inspected at least every 3 years by a professional and your tank pumped as recommended by the inspector (generally every 3 to 5 years). Systems with electrical float switches, pumps, or mechanical components need to be inspected more often. Your service provider should inspect for leaks and look at the scum and sludge layers in your septic tank. If the bottom of the scum layer is within 6 inches of the bottom of the outlet tee or the top of the sludge layer is within 12 inches of the outlet tee, your tank needs to be pumped. Remember to note the sludge and scum levels determined by your service provider in your operation and maintenance records. This information will help you decide how often pumping is necessary. (See the checklist included at the end of the booklet.)

What Does an Inspection Include?

- Locating the system.
- Uncovering access holes.
- Flushing the toilets.
- Checking for signs of backup.
- Measuring scum and sludge layers.
- Identifying any leaks.
- Inspecting mechanical components.
- Pumping the tank if necessary.

Four major factors influence the frequency of pumping: the number of people in your household, the amount of wastewater generated (based on the number of people in the household and the amount of water used), the volume of solids in the wastewater (for example, using a garbage disposal increases the amount of solids), and septic tank size.

Some makers of septic tank additives claim that their products break down the sludge in septic tanks so the tanks never need to be pumped. Not everyone agrees on the effectiveness of additives. In fact, septic tanks already contain the microbes they need for effective treatment. Periodic pumping is a much better way to ensure that septic systems work properly and provide many years of service. Regardless, every septic tank requires periodic pumping.

In the service report, the pumper should note any repairs completed and whether the tank is in good condition. If the pumper recommends additional repairs he or she can't perform, hire someone to make the repairs as soon as possible.

Use water efficiently

Average indoor water use in the typical single-family home is almost 70 gallons per person per day. Leaky toilets can waste as much as 200 gallons each day. The more water a household conserves, the less water enters the septic system. Efficient water use can improve the operation of the septic system and reduce the risk of failure.

High-efficiency toilets

Toilet use accounts for 25 to 30 percent of household water use. Do you know how many gallons of water your toilet uses to empty the bowl? Most older homes have toilets with 3.5- to 5-gallon reservoirs, while newer high-efficiency toilets use 1.6 gallons of water or less per flush. If you have problems with your septic system being flooded with household water, consider reducing the volume of water in the toilet tank if you don't have a high-efficiency model. Plastic containers (such as 1/2-gallon plastic milk jugs) can be filled with small rocks and placed in a toilet tank to reduce the



amount of water used per flush. (Be sure that the plastic containers do not interfere with the flushing mechanisms or the flow of water.) You'll save about ½ gallon of water per flush! You might also consider replacing your existing toilet with a high-efficiency model to achieve even more water savings.

Faucet aerators and high-efficiency showerheads

Faucet aerators help reduce water use and the volume of water entering your septic system. High-efficiency showerheads or shower flow restrictors also reduce water use.

Water fixtures

Check to make sure your toilet's reservoir isn't leaking into the bowl. Add five drops of liquid food coloring to the reservoir before bed. If the dye is in the bowl the next morning, the reservoir is leaking and repairs are needed.

A small drip from a faucet adds many gallons of unnecessary water to your system every day. To see how much a leak adds to your water usage, place a cup under the drip for 10 minutes. Multiply the amount of water in the cup by 144 (the number of minutes in 24 hours, divided by 10). This is the total amount of clean water traveling to your septic system each day from that little leak.

Use Water Efficiently!

- **Install high-efficiency showerheads**
- **Fill the bathtub with only as much water as you need**
- **Turn off faucets while shaving or brushing your teeth**
- **Run the dishwasher and clothes washer only when they're full**
- **Use toilets to flush sanitary waste only (not kitty litter, diapers, or other trash)**
- **Make sure all faucets are completely turned off when not in use**
- **Maintain your plumbing to eliminate leaks**
- **Install aerators in the faucets in your kitchen and bathroom**
- **Replace old dishwashers, toilets, and clothes washers with new, high-efficiency models.**

For more information on water conservation, please visit www.epa.gov/owm/water-efficiency/index.htm



Watch your drains

What goes down the drain can have a major impact on how well your septic system works.

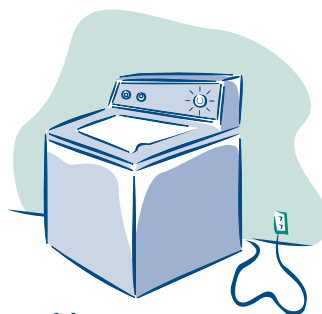
Waste disposal

What shouldn't you flush down your toilet? Dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, and other kitchen and bathroom items that can clog and potentially damage septic system components if they become trapped. Flushing household chemicals, gasoline, oil, pesticides, antifreeze, and paint can stress or destroy the biological treatment taking place in the system or might contaminate surface waters and groundwater. If your septic tank pumper is concerned about quickly accumulating scum layers, reduce the flow of floatable materials like fats, oils, and grease into your tank or be prepared to pay for more frequent inspections and pumping.

Washing machines

By selecting the proper load size, you'll reduce water waste. Washing small loads of laundry on the large-load cycle wastes precious water and energy. If you can't select load size, run only full loads of laundry.

Doing all the household laundry in one day might seem like a time-saver, but it could be harmful to your septic system. Doing load after load does not allow your septic tank time to adequately treat wastes. You could be flooding your drainfield without allowing sufficient recovery time. Try to spread water usage throughout the week. A new Energy Star clothes washer uses 35 percent less energy and 50 percent less water than a standard model.



Care for your drainfield

Your drainfield is an important part of your septic system. Here are a few things you should do to maintain it:

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the drainfield. Flooding the drainfield with excessive water slows down or stops treatment processes and can cause plumbing fixtures to back up.

What can make my system fail?

If the amount of wastewater entering the system is more than the system can handle, the wastewater backs up into the house or yard and creates a health hazard.

You can suspect a system failure not only when a foul odor is emitted but also when partially treated wastewater flows up to the ground surface. By the time you can smell or see a problem, however, the damage might already be done.

By limiting your water use, you can reduce the amount of wastewater your system must treat. When you have your system inspected and pumped as needed, you reduce the chance of system failure.

A system installed in unsuitable soils can also fail. Other failure risks include tanks that are inaccessible for maintenance, drainfields that are paved or parked on, and tree roots or defective components that interfere with the treatment process.

Failure symptoms

The most obvious septic system failures are easy to spot. Check for pooling water or muddy soil around your septic system or in your basement. Notice whether your toilet or sink backs up when you flush or do laundry. You might also notice strips of bright green grass over the drainfield. Septic systems also fail when partially treated wastewater comes into contact with groundwater. This type of failure is not easy to detect, but it can result in the pollution of wells, nearby streams, or other bodies of water. Check with a

septic system professional and the local health department if you suspect such a failure, and remember to have your septic system inspected by a professional at least every 3 years.

Stop, look, and smell!

Failure causes

Household toxics

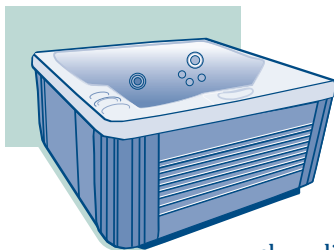
Does someone in your house use the utility sink to clean out paint rollers or flush toxic cleaners? Oil-based paints, solvents, and large volumes of toxic cleaners should not enter your septic system. Even latex paint cleanup waste should be minimized. Squeeze all excess paint and stain from brushes and rollers on several layers of newspaper before rinsing. Leftover paints and wood stains should be taken to your local household hazardous waste collection center. Remember that your septic system contains a living collection of organisms that digest and treat waste.

Household cleaners

For the most part, your septic system's bacteria should recover quickly after small amounts of household cleaning products have entered the system. Of course, some cleaning products are less toxic to your system than others. Labels can help key you into the potential toxicity of various products. The word "Danger" or "Poison" on a label indicates that the product is highly hazardous. "Warning" tells you the product is moderately hazardous. "Caution" means the product is slightly hazardous. ("Nontoxic" and "Septic Safe"



are terms created by advertisers to sell products.) Regardless of the type of product, use it only in the amounts shown on the label instructions and minimize the amount discharged into your septic system.



Hot tubs

Hot tubs are a great way to relax. Unfortunately, your septic system was not designed to handle large quantities of water from your hot tub. Emptying hot tub water into your septic system stirs the solids in the tank and pushes them out into the drainfield, causing it to clog and fail. Draining your hot tub into a septic system or over the drainfield can overload the system. Instead, drain cooled hot tub water onto turf or landscaped areas well away from the septic tank and drainfield, and in accordance with local regulations. Use the same caution when draining your swimming pool.

Water Purification Systems

Some freshwater purification systems, including water softeners, unnecessarily pump water into the septic system. This can contribute hundreds of gallons of water to the septic tank, causing agitation of solids and excess flow to the drainfield. Check with your licensed plumbing professional about alternative routing for such freshwater treatment systems.

Garbage disposals

Eliminating the use of a garbage disposal can reduce the amount of grease and solids entering the septic tank and possibly clogging the drainfield. A garbage disposal grinds up kitchen scraps, suspends them in water, and sends the mixture to the septic tank. Once in the septic tank, some of the materials are broken down by bacterial action, but most of the grindings have to be pumped out of the tank. Using a garbage disposal frequently can significantly increase the accumulation of sludge and scum in your septic tank, resulting in the need for more frequent pumping.

***Not in My
Septic System!***

X Cloggers
diapers, cat litter, cigarette
filters, coffee grounds,
grease, feminine hygiene
products, etc.

X Killers
household chemicals,
gasoline, oil, pesticides,
antifreeze, paint, etc.

Improper design or installation

Some soils provide excellent wastewater treatment; others don't. For this reason, the design of the drainfield of a septic system is based on the results of soil analysis. Homeowners and system designers sometimes underestimate the significance of good soils or believe soils can handle any volume of wastewater applied to them. Many failures can be attributed to having an undersized drainfield or high seasonal groundwater table. Undersized septic tanks—another design failure—allow solids to clog the drainfield and result in system failure.

If a septic tank isn't watertight, water can leak into and out of the system. Usually, water from the environment leaking into the system causes hydraulic overloading, taxing the system beyond its capabilities and causing inadequate treatment and sometimes sewage to flow up to the ground surface. Water leaking out of the septic tank is a significant health hazard because the leaking wastewater has not yet been treated.

Even when systems are properly designed, failures due to poor installation practices can occur. If the drainfield is not properly leveled, wastewater can overload the system. Heavy equipment can damage the drainfield during installation which can lead to soil compaction and reduce the wastewater infiltration rate. And if surface drainage isn't diverted away from the field, it can flow into and saturate the drainfield.

For more information

Local Health Department

EPA Onsite/Decentralized Management Homepage

www.epa.gov/owm/onsite

EPA developed this Web site to provide tools for communities investigating and implementing onsite/decentralized management programs. The Web site contains fact sheets, program summaries, case studies, links to design and other manuals, and a list of state health department contacts that can put you in touch with your local health department.

National Small Flows Clearinghouse

www.nesc.wvu.edu

Funded by grants from EPA, the NSFC helps America's small communities and individuals solve their wastewater problems. Its activities include a Web site, online discussion groups, a toll-free assistance line (800-624-8301), informative publications, and a free quarterly newsletter and magazine.

Rural Community Assistance Program

www.rcap.org

RCAP is a resource for community leaders and others looking for technical assistance services and training related to rural drinking water supply and wastewater treatment needs, rural solid waste programs, housing, economic development, comprehensive community assessment and planning, and environmental regulations.

National Onsite Wastewater Recycling Association, Inc.

www.nowra.org

NOWRA is a national professional organization to advance and promote the onsite wastewater industry. The association promotes the need for regular service and educates the public on the need for properly designed and maintained septic systems.

Septic Yellow Pages

www.septicyellowpages.com

The Septic Yellow Pages provides listings by state for professional septic pumpers, installers, inspectors, and tank manufacturers throughout the United States. This Web site is designed to answer simple septic system questions and put homeowners in contact with local septic system professionals.

National Association of Wastewater Transporters

www.nawt.org

NAWT offers a forum for the wastewater industry to exchange ideas and concerns. The NAWT Web site lists state associations and local inspectors and pumpers.



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Cincinnati, OH 45241

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Office of Water

U.S. Environmental Protection Agency

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Septic System Dos and Don'ts

(adapted from National Small Flows Clearinghouse)

Dos

- Check with the local regulatory agency or inspector/pumper if you have a garbage disposal unit to make sure that your septic system can handle this additional waste.
- Check with your local health department before using additives. Commercial septic tank additives do not eliminate the need for periodic pumping and can be harmful to the system.
- Use water efficiently to avoid overloading the septic system. Be sure to repair leaky faucets or toilets. Use high-efficiency fixtures.
- Use commercial bathroom cleaners and laundry detergents in moderation. Many people prefer to clean their toilets, sinks, showers, and tubs with a mild detergent or baking soda.
- Check with your local regulatory agency or inspector/pumper before allowing water softener backwash to enter your septic tank.
- Keep records of repairs, pumpings, inspections, permits issued, and other system maintenance activities.
- Learn the location of your septic system. Keep a sketch of it with your maintenance record for service visits.
- Have your septic system inspected at least every 3 years and pumped periodically (generally every 3 to 5 years) by a licensed inspector/contractor.
- Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.

Don'ts

- Your septic system is not a trash can. Don't put dental floss, feminine hygiene products, condoms, diapers, cotton swabs, cigarette butts, coffee grounds, cat litter, paper towels, latex paint, pesticides, or other hazardous chemicals into your system.
- Don't use caustic drain openers for a clogged drain. Instead, use boiling water or a drain snake to open clogs.
- Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.

Homeowner Septic System Checklist

Septic System Description

Contact your local authority if you don't have this information.

Date system installed _____

Installer _____

Phone _____

Tank size _____ gallons

Capacity _____ bedrooms

Type ☐ conventional

☐ alternative (type) _____

Things to keep in mind:

- ✓ *Inspect your system (every 1 to 3 years) and pump your tank (as necessary, generally every 3 to 5 years).*
- ✓ *Use water efficiently.*
- ✓ *Don't dispose of household hazardous wastes in sinks and toilets.*
- ✓ *Plant only grass over and near your septic system. Roots from nearby trees or shrubs might clog and damage the drainfield.*
- ✓ *Don't drive or park vehicles on any part of your septic system. Doing so can compact the soil in your drainfield or damage the pipes, tank, or other septic system components.*

Not in My Septic System!

X Cloggers
diapers, cat litter, cigarette filters, coffee grounds, grease, feminine hygiene products, etc.

X Killers
household chemicals, gasoline, oil, pesticides, antifreeze, paint, etc.



For more information about septic systems, contact:

Clean Water
starts at
Home

U.S. Environmental Protection Agency
www.epa.gov/owm/onsite/

Septic System Maintenance Record

Next Service	Scheduled Activity	Pumping Co./ Phone	Activities Completed	Comments
Jan. 2003	inspection	Joe Pumper 555-1234	inspection	sludge layer okay-may need pumping next year

Place on electrical box (fuse box) or other convenient location.

Pipeline



Small Community Wastewater Issues Explained to the Public

Buying or Selling a Home with an Onsite Wastewater System



The simple words “with septic” can spell trouble for someone trying to sell their home and be intimidating for a prospective buyer. If you are selling a house that uses a septic system for its wastewater treatment, or you are thinking of buying a house that uses such a system, there are things both parties need to know to make the transaction go smoothly. The septic system, if properly designed and installed, and adequately maintained, can be extremely efficient and the presence of a septic system on the property should not

dissuade you from purchasing the home. On the other hand, if you have always been on a municipal sewer service, there are things you need to know about this type of wastewater treatment system.

Conventional septic systems are a simple and effective way to treat household wastewater. They contain no moving parts and are easy to operate and maintain. A properly functioning septic system performs the important function of getting rid of waste while preserving your family’s health and safety. And preventing groundwater pollution from

failing septic systems should be a priority for every community and homeowner.

However, unlike a municipal wastewater system, the entire septic system is located on the home site. This means the homeowner is totally responsible for the operation and upkeep of the system. If the system fails, the owner pays for the repair or replacement, which can be expensive. Because of the potential expense of replacement, the prospective buyer will want to have the condition of the septic system thoroughly evaluated and factor those results into what he or she offers for the property. From the seller’s perspective, providing accurate information through an inspection can help protect the seller from liability.

Asking the Right Questions, Giving the Right Answers

“In addition to an inspection, you need to ask lots of questions before committing to buying a house with a septic system,” advises Zane Satterfield, engineering scientist with the National Environmental Services Center. “Get as much information about the system up front as you can. Has there been a history of trouble? How often has it

been pumped? When was the last time it was pumped? How old is the system and when was it permitted? These are the basic questions buyers should ask."

Prospective buyers can also be on the lookout for potential problems with the system as they tour the inside of the house. Slow draining sinks,

toilets that gurgle when flushed, and off odors are all possible signs of problems with the septic system.

As the seller, the homeowner should make available all pertinent information about the existing system. "Sellers should always disclose what they know about their system to buyers through a property condition disclosure form," says Paul Ragland, a real estate agent in Morgantown, West Virginia. "While most states have a standard disclosure form, handwritten forms are fine and diagrams are encouraged. Buyers and sellers should sign and date this form before closing." He explains that if this disclosure brings up any unanswered questions, it is good for both parties to deal with them before the closing.

All states have laws regarding disclosure. They vary from state to state, but, in general, any fact or defect that could affect the buyer's decision to purchase or influence what price they would offer for the property must be disclosed. A seller can be held liable, in some cases for double or triple damages, if it is determined that he or she neglected to disclose a known defect to a buyer. Sellers should put themselves in the position of the buyer and ask themselves what they would want to know about the system if they were buying it. When in doubt, it's best to disclose.

The age of the system, the pumping record, inspection history, a sketch of the tank and drainfield location on the property, and any operational problems encountered during

its lifetime are some of the specific elements that should be included. A disclosure form, however, does not eliminate the need for an inspection.

Inspections Reveal the Truth

Whether you are buying or selling, an inspection of the home's septic system is highly recommended. Some states require a septic system inspection at the time of property transfer. However, most states do not. Also, most states focus their inspection efforts during the initial installation and do not require regular inspections for conventional systems. As a result, it is possible that a system may not have been inspected since it was first installed. In some cases, even though the state, town, or county may not require an inspection, the bank providing the homeowner loan may require one.

Your real estate agent should be familiar with local codes and bank requirements and be able to locate a qualified septic system inspector. State and local codes may vary with regard to who is authorized to conduct inspections—sanitarians, engineers, or private inspectors. The local health department should be able to provide this information if no agent is involved in the sale. The system inspection should be conducted as soon as the property is placed on the market so repairs can be made if necessary.

An official system evaluation or inspection helps to protect the value of the buyer's investment by ensuring that the system can safely accommodate their wastewater.



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Buyers planning any construction projects such as a room addition or extensive landscaping should be aware that heavy machinery and certain construction materials such as paint and solvents can inadvertently damage a septic system or alter its performance. They should also be aware that if an addition is to be made to the house, an addition will likely also have to be made to the size of the drainfield. This is because health departments size the drainfield based partly on the house occupancy and the number of bedrooms is commonly used as an estimator of occupancy. Prospective buyers should also be aware that most regulations require that a reserve area be set aside in case a drainfield needs to be

replaced. This reserve area cannot be built on.

The buyer can conduct his or her own informal inspection by carefully walking around the yard near or above the drainfield area. Satterfield explains that any smelly, soggy places likely indicate a failing or poorly functioning drainfield. However, he warns that even though the yard may be nice and dry, you can't assume that things are fine. If the house has been unoccupied for an extended period of time, the system

was not being used and any mushy places will have dried up.

Ragland states that one thing all sellers with septic systems need to understand is that they should not vacate their home before having the system inspected. The inspection will not be valid if the house has not been occupied and local health agencies may not allow an inspection to be conducted unless the home has been occupied for 30 consecutive days. If sellers leave the home before having this done, it may result in having a substantial amount of the sellers' funds being escrowed from the closing proceeds when the property sells. (When the sale is closed, the new buyer has a

responsibility to notify the county health department after 30 days of occupancy, so that the test can be performed, and all escrowed money can be disbursed.) Some local codes may require specific inspection procedures for homes that have been vacant for some time.

What is a septic system?

There are two main parts to a conventional septic system: the septic tank and the drainfield.

Household wastewater first flows into the underground, watertight septic tank where it is retained for at least a day. In the tank heavier solids in the wastewater settle to the bottom forming a layer of sludge, and grease and lighter solids and oils float to the top forming a layer of scum. The sludge and scum remain in the tank where naturally occurring bacteria work to break them down. Typically, the sludge accumulates faster than it is broken down, however, and this is why septic tanks must be routinely pumped out.

The separated wastewater in the middle layer of the tank flows by gravity into the drainfield for further treatment as more wastewater enters the septic tank from the house. If too much water is flushed into the septic tank in a short period of time, the wastewater flows out of the tank before it has had time to separate. This can happen on days when water use is unusually high (laundry day, for example), or more often if the septic tank is too small for the needs of the household.

When wastewater leaves a septic tank too soon, solids can be carried with it to the drainfield. Drainfields provide additional treatment for the wastewater by allowing it to trickle from a series of perforated pipes, through a layer of gravel, and down through the soil. The soil and the biomat that form act as a natural filter, supporting the growth of organisms that help treat the waste. Solids damage the drainfield by clogging the small pores between the soil particles. Excessive water usage can result in more water going to the drainfield than the soil can absorb caus-

ing wastewater to either come to the surface or to back up into the house.

Annual inspections of your septic system are recommended to ensure that it is working properly and to determine when the septic tank should be pumped. Systems that have moving parts may require more frequent inspections. (These types of system will be discussed more below.) By having your system inspected and pumped regularly, you can prevent the high cost of septic system failure.

What to Expect with the Inspection

A septic system inspection often includes these steps:

1. locating the system,
2. uncovering the manhole and inspection ports,
3. flushing the toilets,
4. measuring the scum and sludge layers, and
5. checking the tank and drainfield.

Locating the system—Even a professional may have trouble locating your system if the access to your tank is buried. Metal tanks and concrete

Additional Questions to Ask the Seller

If you are thinking about buying a home with an onsite wastewater system, here are some questions you should ask:

- How many people have been living in the house? If the seller's household is bigger than what the system was designed for it could lead to an overloaded system. On the other hand, an undersized system may function perfectly well if the house was occupied by a single person, but have problems if the buyer has a larger family. A comparison of the actual water usage records of the buyer's and seller's households can be useful if both are on metered water systems. In cases where there is extensive outdoor water usage, winter water bills are more indicative of the volume of water that goes through the septic system.
- Is the system a conventional system or an alternative system? If it is an alternative system, what are the components? How is it designed to work?
- If the home has its own well, have there been any problems with the quality of the well water? The presence of bacteria or high level of nitrates in well water could signal a failed septic system.
- Have any bedrooms been added to the house? Was the drainfield enlarged at that time?
- Are there any other water disposal systems on the property? Separate disposal of water from a clothes washer to a ditch or stream is illegal. Is the system large enough to accommodate the additional water if the wash water is rerouted to the septic system? Water from roof drains and basement sump pumps, however, should not be routed through the septic system and should be disposed of appropriately away from the drainfield.



tanks, because the latter contain rebar, can be located with a metal detector. Electronic devices that emit a signal can also be used. They are flushed down a toilet and retained in and retrieved from the tank. Another way to start looking is to go into the basement and determine the direction the sewer pipe exits the house. Back outside, the inspector will probe the soil to locate the buried piping and tank. Once the system is found, be sure to keep a map of it on hand to save time on future service visits.

Uncovering the manhole and inspection ports—This may entail some digging in your yard. If they are buried, it will make future inspections easier if elevated access covers or risers are installed to access the ports.

Flushing the toilets—This determines if the plumbing going to the system is working correctly. Sometimes a dye test will be performed where dye is flushed to see if it shows up in places where it shouldn't.

Measuring the Scum and Sludge Layers—The contractor measures the scum and sludge layers using a long stick or monitoring device. If the scum layer is within three inches of the inlet baffle or if the solids are more than halfway up from the bottom, the tank should be pumped.

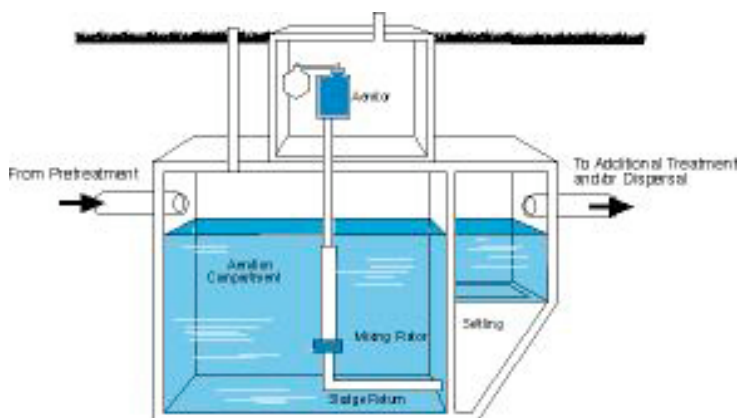
Checking the Tank and the Drainfield—The contractor will check the condition of the baffles or tees, the walls of the tank for cracks, and the drainfield for any signs of failure. If your system includes a distribution box, drop box, or pump, the contractor will check these too.

Once the drainfield is located, a soil probe is usually used to determine the length and the width of the drainfield trenches. This can reveal whether the size of the drainfield is adequate. A soil auger is used to access the trench bottom so the inspector can determine the amount of biomat growth. Periodic inspections will help the homeowner keep track of how well the drainfield is operating.

ment components include aerobic treatment units (ATUs), sand filters, and peat filters. Examples of enhanced dispersal systems include sand mounds, low-pressure pipe systems, and drip dispersal lines.

Some alternative system components (e.g., ATUs) have mechanical components such as motors to aerate the wastewater. Also, most alternative systems use pumps to move the liquid through the system,

Aerobic Treatment Unit



Alternative Septic Systems

On some home sites, a conventional, gravity-flow septic system cannot be used. This may be due to poor soil conditions, shallow groundwater depth, or a small lot size. In these cases, other types of systems—often referred to as alternative septic systems—are required.

Alternative systems are intended to overcome site limitations by providing additional treatment of the wastewater prior to dispersal or by optimizing the final dispersal, and, in some cases, both. Examples of enhanced treat-

help pressurize the dispersal system to ensure equal distribution, or to provide intermittent dosing of the drainfield. Because alternative systems are more complicated, regular monitoring and maintenance is even more important than for conventional systems and many states require the homeowner to have a maintenance contract in place.

The pumps associated with many alternative systems may work on a timer or turn on when the water level reaches a certain height in a pump chamber. Because there is lim-

Questions the Prospective Buyers Should Ask Themselves

If you are planning to purchase a home with an onsite wastewater system, here are some questions you should ask yourself:

- Am I willing to provide the on-going maintenance necessary to keep a septic system functioning properly? Am I likely to remember to have the tank pumped as needed? Am I willing to pay for a service provider to provide regular monitoring and maintenance for an alternative system?
- Does my family have reasonable water usage habits that will work with a septic system? Will my teenagers be willing to no longer shower by the hour?
- Will I need to upgrade the system to match my family's expected water usage?



ited space for storage of wastewater in the pump chamber, it is important to be able to react quickly if the pump fails to function. Most systems with pumps have a high-water alarm to notify the occupant of problems and the homeowner should have an arrangement in place with a contractor to promptly respond to such situations.

Alternative systems are proven, reliable treatment options. However, a prospective buyer of a home with an alternative septic system needs to be aware that they have higher operating and maintenance costs than conventional systems and the replacement costs, should one fail, are much more than those for conventional systems. This makes it very important for both the buyer and the seller to determine the current condition of the system through both maintenance records and thorough inspection.

Proper Care is the Key

Whether it is a conventional or an alternative system, proper operation and maintenance of your septic system can have a significant impact on how well it works and how long it lasts. Septic system maintenance can be compared to automobile maintenance because only a little effort on a regular basis can save money and significantly prolong the life of the system.

1. Maintain a routine pumping schedule. How often your tank needs to be pumped depends on the tank size, the number of people living in your home, and the habits of your particular household. The use of garbage disposals will increase the pumping frequency.
2. Flush only toilet tissue and wastewater. No paper towels, sanitary supplies, cigarette butts, kitty litter, or dental floss.
3. Protect the drainfield. Keep a short grass cover over the area and do not drive over it. Divert



roof drains away from it. Do not plant trees over or near the drainfield.

4. Use water wisely. Avoid doing laundry all on one day, for instance, and immediately repair leaking faucets and toilets. Replace any older toilets that use more water.
5. Keep detailed records of repairs, pumping inspections, and other maintenance activities.

Armed with some basic knowledge about these systems, septic systems do not have to be a source of fear for a new homeowner or a roadblock to a quick sale for the current resident.

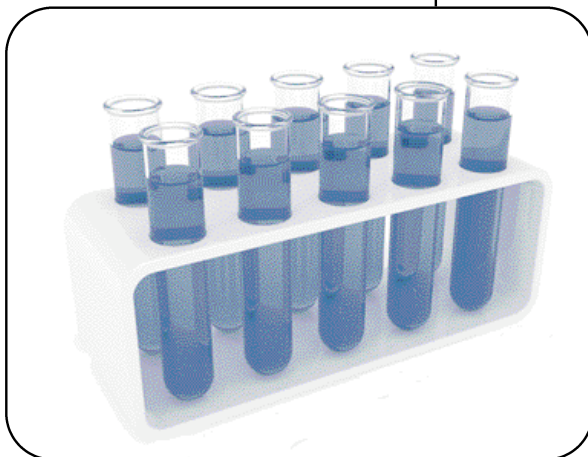
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Private Wells Should Be Tested, Too

Many homes that have onsite wastewater systems get their drinking water from a private well. Well owners are responsible for maintaining their wells and should have them tested regularly.

"Being a good water well steward means having regular—at least yearly—tests for coliform bacteria," says Cliff Treysen, director of public awareness for the National Ground Water Association. "Annual testing can be valuable because it establishes a record of water quality. This record can be helpful in solving any future problems and in obtaining compensation if someone damages your water supply."

Having a record of well tests can also be helpful when it comes time to sell your home.

Before buying a home with a well, contact the local health department. They will either do a free or inexpensive test for the presence of bacteria, or refer you to a qualified laboratory. To test for other substances, such as metals or other chemicals, a more extensive and costly sampling and testing program would have to be conducted, typically by an independent laboratory.

Learn more about wells by visiting the National Environmental Services Center (NESC) webpage devoted to wells at www.nesc.wvu.edu/subpages/wells.cfm.

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Products Available Online



A key component of the National Environmental Services Center's mission is to offer free and low-cost products related to drinking water and wastewater. To accomplish this, we have developed an online shopping cart which will make it easier to find and order any of our over 1500 products.

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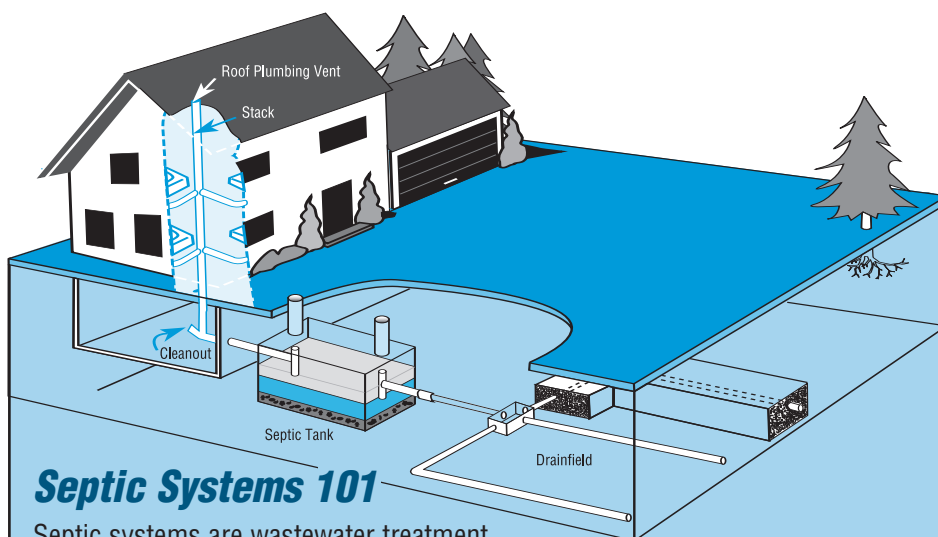
Small Community Wastewater Issues Explained to the Public

Septic Systems and Source Water Protection

Homeowners Can Help Improve Community Water Quality

If your home has a septic system, you are no doubt aware that this is a common way to treat residential wastewater. In fact, septic systems and related forms of treatment that experts call decentralized wastewater treatment systems (septic systems, private sewage systems, onsite sewage disposal systems) are some of the most common waste dispersal methods in the country.

According to the U.S. Environmental Protection Agency (EPA), decentralized wastewater treatment systems collect, treat, and release about four billion gallons of effluent per day from an estimated 26 million homes and businesses. The percentage of homes and businesses served by these systems varies from state to state, from a high of about 55 percent in Vermont to a low of about 10 percent in California. Nationwide, approximately 40 percent of the new homes being built will rely on some kind of onsite system to treat wastewater. (Ground Water Report to the Nation: A Call to Action, 2007)



Septic Systems 101

Septic systems are wastewater treatment systems that collect, treat, and disperse of wastewater generated by your home or business. The wastewater is treated onsite, rather than collected and transported to a centralized community wastewater treatment plant.

A typical septic system consists of two main parts: a septic tank and a soil absorption system, also known as a drainfield, leachfield, or disposal field. Underground pipes connect the entire system.

The septic tank is a buried, watertight container usually made of concrete, fiberglass, or polyethylene. It holds the wastewater long enough to allow the solids to settle out and the fats, oil, and grease to float to the surface. It also allows partial decomposition of the solid materials. Effluent from the middle layer flows out to the drainfield for further treatment in the soil.

Septic systems can contribute to source water contamination for various reasons including improper location of the system, poor design, faulty construction, incorrect operation, and poor or no maintenance of the system.

By following the basic recommendations previously mentioned, you can help ensure that your system continues to function properly.

As many of us migrate further from central cities and occupy homes served by decentralized treatment systems, septic system care is more important than ever. By keeping your onsite system in top working condition, you can save money, increase the value of your home, and also feel good that you've helped your community both now and for future generations.

As the owner of an onsite wastewater system, you may not be aware that you play an important role in protecting your community's water quality. Source water—streams, lakes, rivers, or groundwater—is, as the name suggests, the source of our drinking water, whether we get it from a local water district treatment plant or from a privately owned well. To maintain the most pristine water quality possible,

we need to consider the activities that take place in the source water area and make sure that their environmental impacts on nearby waterways are minimal.

Unfortunately, EPA research shows that one of the biggest causes of pollution to our waterways is septic systems that are not working as they should.

When a septic system is not properly maintained or fails, untreated domestic wastewater can reach the source water. Bacteria and viruses from human waste can cause dysentery, hepatitis, and typhoid fever and the cumulative effect of numerous failing septic systems can become a major source of pollution. And, the more polluted the source water, the more costly it is to clean for human consumption.

Maintenance Pays

Of course, the best way to deal with a broken septic system is to not let it get broken in the first place. Since it can be difficult for homeowners to know if their systems are slowly failing (as defined by each state), you can greatly reduce that likelihood, and gain peace of mind, simply by having your system regularly pumped and inspected. This preventative measure costs thousands less than does the cost of repairing or replacing a non-functioning system. (See the sidebar on the next page for a suggested pumping schedule.)

The following tips will also help maintain a healthy septic system:

- Do not use caustic drain cleaners on clogged pipes. Instead, use boiling water or a drain snake to open clogs.

- Conserve water to avoid hydraulic overloading of the system. Repair leaky faucets and toilets. Use low-flow fixtures.
- Use bathroom cleaners and laundry detergent in moderation. (Find recommended cleaning products in the NESC brochure titled "Alternative Household Cleaners." Find how to order info on page 8.)
- Your septic system is not a trash can. Do not flush disposable diapers, tampons, condoms, paper towels, cat litter, or cigarettes into the system. These items quickly fill your septic tank with solids, decrease the system's efficiency, and will require it to be more frequently pumped. Trash flushed down the toilet can also clog the pipelines, causing wastewater to back up into your home.
- Avoid dumping grease or fats down the kitchen drain. They solidify and the accumulation may contribute to plumbing and system blockages.
- Keep paint, varnish, thinners, oil, photographic solutions, pesticides and other hazardous chemicals out of your system. Even in small amounts, these items can destroy the biological digestion taking place in your septic system. Do not flush unused medicines. Check with your local health department for disposal recommendations for your area.
- The use of garbage disposals is discouraged. If you have a garbage disposal, use it sparingly. Garbage disposals add unnecessary solids and nutrients to the system.



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Estimated Septic Tank Pumping Frequencies In Years*

*These figures assume there is no garbage disposal unit in use. If one is in use, pumping frequency may need to be increased.

Tank Size (gals.)	Household Size (number of people)					
	1	2	3	4	5	6
500	5.8	2.6	1.5	1.0	0.7	0.4
750	9.1	4.2	2.6	1.8	1.3	1.0
900	11.0	5.2	3.3	2.3	1.7	1.3
1000	12.4	5.9	3.7	2.6	2.0	1.5
1250	15.6	7.5	4.8	3.4	2.6	2.0
1500	18.9	9.1	5.9	4.2	3.3	2.6
1750	22.1	10.7	6.9	5.0	3.9	3.1
2000	25.4	12.4	8.0	5.9	4.5	3.7
2250	28.6	14.0	9.1	6.7	5.2	4.2
2500	31.9	15.6	10.2	7.5	5.9	4.8

(Source: Pennsylvania State University Cooperative Extension Service.)

- Do not drive over the system or the drainfield. This can compact the soil and break the piping of the system.
- Redirect surface water flow away from your system.
- Plant a 'green belt' or grassy strip between the drainfield and the shoreline if near a water body.
- Periodically check for signs of system failure: areas in the yard that remain moist during dry weather or patches of lush grass or plant growth. If you see signs of failure, schedule an inspection immediately.

Most typical septic systems should be inspected every two to three years but, depending on the system size and the number of people in the home, this frequency could change. Any system with mechanical parts, such as pumps and filters, should be inspected annually. If your tank has never been pumped, or is not accessible, once it is uncovered, put a watertight riser on it for future accessibility.

If your system is already failing, have it inspected by a professional and repaired or replaced as soon as possible.

A Healthy Septic System is an Investment

Your home represents a significant investment. For most of us, our house is the single biggest item we'll ever purchase and, consequently, represents a significant proportion of our net worth. Simply put: a failing septic system will lower your property value and may even make selling your home a problem. No one wants to buy a house with a stinky, soggy yard.

Functioning onsite systems, on the other hand, can add value to your home and good water quality will benefit your property value. This fact was borne out in a study conducted by Bemidji State University in Minnesota, where homes on lakes with good water quality were more valuable and had seen their value rise more quickly than those on lakes with marginal or poor water quality. (See the sidebar on page 4 for more information about water quality and land value in Minnesota.) As you would expect, people pay more for building sites and homes along clean stretches of water.

Another economic benefit of maintaining your onsite system is that it helps ensure the clean, safe drinking water, which is an essential ingredient of a healthy and viable community. Contamination of drinking water sources can cause a community significant expense and affect public health. Remember, it will cost you less in the long run if you can prevent contamination of your drinking water source rather than incur the high cost of treat-



Water Quality Adds Value to Lakefront Property

Minnesota's 10,000 fresh water lakes are essential to the economic well-being of the state – culturally, economically, and ecologically. They are assets worthy of environmental protection. The challenge is determining the best way to protect the lake water quality with the high rate of development along their shores. Good environmental policies are more effective and less expensive than restoration efforts.

While the overall quality of Minnesota lakes may be good, lakeshore development continues to degrade lake quality. A 2003 study, conducted by the Mississippi Headwaters Board and the Bemidji State University, investigated the effect of water quality on property values to help legislators formulate the best public policies. The quality of the surrounding water was shown to play a significant role in the price of property. Water quality was determined to have a positive relationship with property prices. In other words, the more pristine the water, the more potential homeowners were willing to pay to live there. The economic benefits of water quality were shown to be a good incentive for promoting effective protection policies.

ing the water or locating and developing alternate water sources. Reducing contamination to ground-water reduces the cost of drinking water.

Quality of Life

A non-working septic system can pollute your own yard and surrounding waters—like the lake where you like to put in your bass boat on a pretty Saturday morning or that rocky little creek where your grandkids like to catch

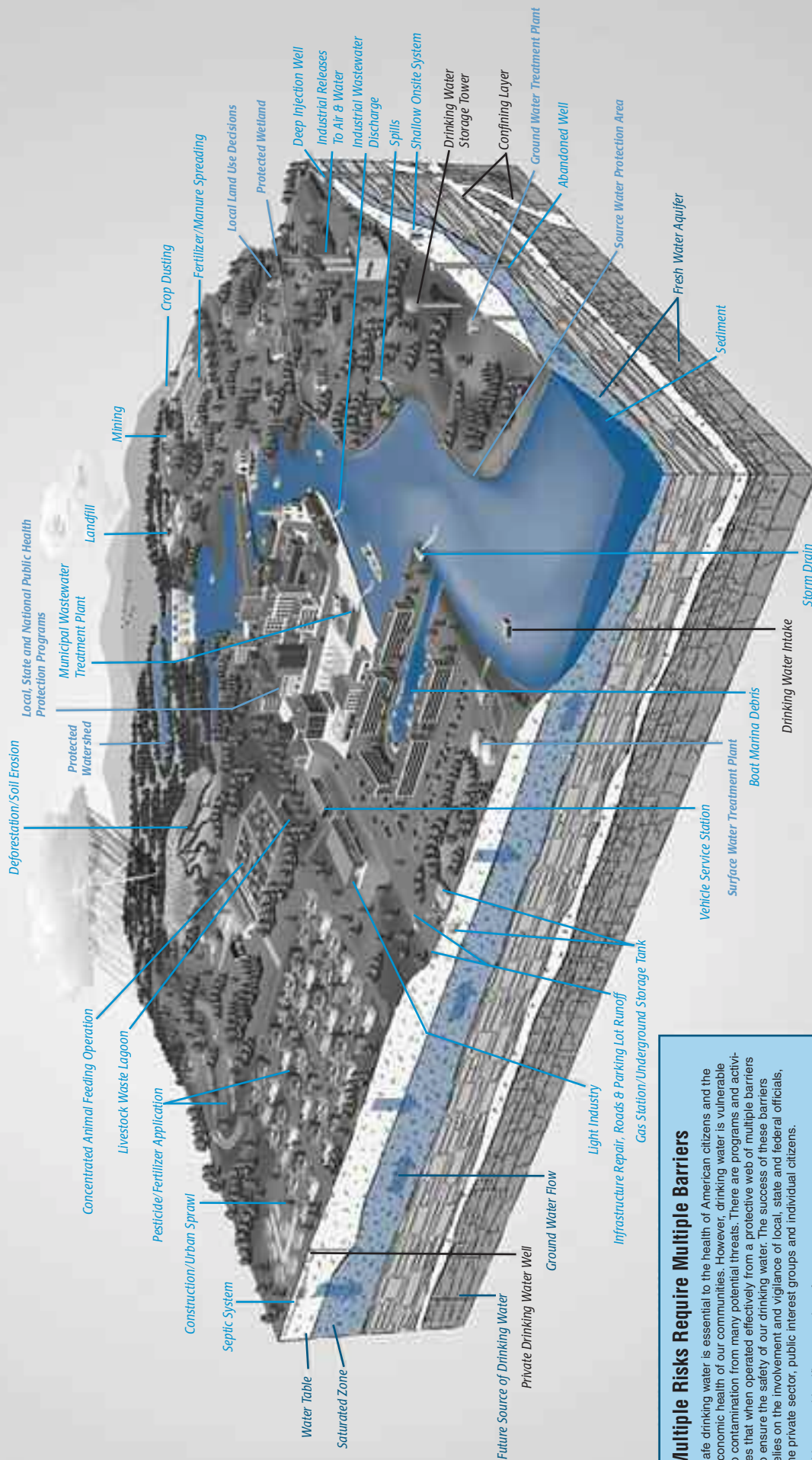
crawfish. Imagine launching your boat onto a sea of green, foamy algae caused by excess nitrates in the water from a leaking septic tank. And you probably wouldn't want the kids splashing around in that creek if the water was murky from untreated sewage.

The following example describe how inadequate septic system maintenance can change the whole picture.

Shelburne Beach, Vermont, is a local swimming beach on a central portion of Lake Champlain in the town of Shelburne, Vermont. Bacteria leaking from residential septic systems caused excess *E. coli* in a nearby tributary, resulting in occasional beach closures. As a result, state officials placed the offending one-mile unnamed tributary on its section 303(d) list for *E. coli* in 1998. (Section 303(d) of the Clean Water Act requires states to develop a list of waters not meeting water quality standards or having impaired uses. Listed waters must be prioritized, and a management strategy or total maximum daily load must subsequently be developed for all listed.)

The town identified six residential septic systems along the stream as the most likely sources and local officials encouraged the homeowners to correct the deficiencies in their septic systems. Between 1998 and 2001, all six homeowners rebuilt their systems by installing new tanks and drainfields. Subsequent monitoring data showed that the stream and beach consistently met water quality standards, and the tributary was removed from the state's 303(d) list in 2004.

Safe Drinking Water Act – Protecting America's Public Health



Multiple Risks Require Multiple Barriers

Safe drinking water is essential to the health of American citizens and the economic health of our communities. However, drinking water is vulnerable to contamination from many potential threats. There are programs and activities that when operated effectively from a protective web of multiple barriers to ensure the safety of our drinking water. The success of these barriers relies on the involvement and vigilance of local, state and federal officials, the private sector, public interest groups and individual citizens.

This poster identifies examples of:

1. *Surface and groundwater sources of drinking water*
2. *Potential threats to these drinking water sources*
3. *The multiple barriers that together protect our nation's public health.*



Safe Drinking Water Hotline - (800) 426-4791 | Safewater Web Site - www.epa.gov/safewater

Adapted by the NESC from the Safe Drinking Water Act – Protecting America's Public Health Poster.
The original full-color poster can be downloaded or ordered from www.epa.gov/safewater/publicoutreach/landscapeposter.html

Conserving Water Prolongs Septic System Life

ask about



Overloading a septic system can cause it to malfunction. Here are some steps to reduce water consumption in the home:

- 1** Use dishwashers and clothes washers only when fully loaded.
- 2** Take short showers instead of baths and avoid letting faucets run unnecessarily.
- 3** Replace old water fixtures with new water-efficient showerheads, faucets, and toilets. Look for the new WaterSense rating given by the EPA. This rating system helps consumers identify high-performance, water-efficient products that can reduce water use in the home and help preserve the nation's water resources. You can find EPA's WaterSense rated products at www.epa.gov/watersense/index.htm.
- 4** Repair and replace any leaking fixtures immediately. (Nearly 14 percent of the water a typical homeowner pays for is never even used—it leaks down the drain.)

Untreated flow from your septic system has the potential to contaminate groundwater, too. Chris Swann, a watershed planner with the Center for Watershed Protection, warns, "Septic system failure delivers a significant amount of pollutants to local water bodies, especially in coastal and lake shoreline areas. The threat of bacterial contamination becomes very important. Many reports of disease outbreaks are linked to groundwater contamination by septic system effluent." Swann stresses that improved management protocols and tougher performance standards for new development are critical to reducing the negative effects of onsite systems.

The negligent homeowner who allows his or her onsite system to contaminate the local environment can affect the entire community. Increased bacteria levels in groundwater, lakes and streams can present a public safety issue. Any contact with untreated human waste can pose a significant risk to public health. Untreated effluent from failing systems in local water bodies adversely impacts wildlife and aquatic populations.

Everyone deserves to live in a healthy environment and having your septic tank routinely pumped and inspected can help achieve the goal of a clean community.

Related Pipeline Issues

Pharmaceuticals and Personal Care Products: An Overview, Winter 2007

Septic Systems—A Practical Alternative for Small Communities, Summer 2004

How to Keep Your Water 'Well,' Summer 2002

Watershed Management, Fall 2006

Maintaining Your Septic System—A Guide for Homeowners, Fall 2004

Archived issues of Pipeline can be downloaded at www.nesc.wvu.edu/pipeline.cfm or ordered from NESC. See back cover for details.

Additional Resources

"Protecting Your Groundwater Source," *On Tap*, Spring 06 www.nesc.wvu.edu/pdf/dw/-groundwater/OT_SP06_PROTECT.pdf

"Making an Impact: The Watershed Approach" by Caigan M. McKenzie, *Small Flows Quarterly*, Fall 2006, www.nesc.wvu.edu/pdf/-ww/publications/smallflows/magazine/SFQ_FA06.pdf

Groundwater Remediation Saving the Source by Kathy Jespersen, NESC Editor, *On Tap*, Fall 2003, www.nesc.wvu.edu/pdf/dw/groundwater/remediation_OT_FA03.pdf

"Ground Water Report to the Nation: A Call to Action," Ground Water Protection Council, 2007, www.gwpc.org/-CallToAction/

Reprint Info

Readers are encouraged to reprint Pipeline articles in local newspapers or include them in flyers, newsletters, or educational presentations. Please include the name and phone number of the National Environmental Service Center (NESC) on the reprinted information and send us a copy for our files. If you have any questions about reprinting articles or about any of the topics discussed in this newsletter, please contact the NESC at (800) 624-8301.



NESC's Newest Project Helps Small Communities Protect Water

"An ounce of prevention is worth a pound of cure," Benjamin Franklin famously stated more than 250 years ago. This simple philosophy describes a new environmental project—SMART About Water—designed to protect drinking water quality.

Funded by a \$3 million grant from the U.S. Environmental Protection Agency (EPA), SMART About Water is being orchestrated by West Virginia University's National Environmental Services Center (NESC) in partnership with the Rural Community Assistance Partnership (RCAP). The program is designed to provide training and technical assistance about source water and wellhead protection planning to small and rural communities during 2008 and 2009 and will focus on untreated wastewater from failing septic and sewer systems, the largest contributor to water quality degradation.

According to EPA, communities derive several important benefits when they protect their source water:

- If source water is contaminated, it threatens public health.
- The better the water is when it reaches the treatment plant, the easier and cheaper it is to treat.
- The cost of dealing with contaminated groundwater ranges from 30 to more than 200 times the cost of wellhead protection.
- Clean water and healthy ecosystems are vital in terms of quality of life for both humans and animals.

Although water quality has improved in the three decades since passage of the Clean Water and Safe Drinking Water Acts, pollution problems linger. Previous efforts concentrated on reducing point source pollution, such as from industrial sites. Water quality issues now are related to the cumulative effect of nonpoint source pollution—untreated wastewater, agricultural fertilizers and pesticides, stormwater runoff, and roadway pollutants—that impact the physical, chemical, and biological health of nearby waters.

Visit the SMART About Water Web site at: www.nesc.wvu.edu/SMART/ for more information about this project.



**A Project of the
National Environmental
Services Center
at West Virginia University,
with the Rural Community
Assistance Partnership,
under a Cooperative Agreement
of the U.S. Environmental Protection
Agency, Office of Ground Water
and Drinking Water**

RELATED NESC PRODUCTS

Homeowner's Septic Tank Information Package

This package is one of NESC's most popular products. Included in the package are homeowner septic tank information brochures, newsletters, and fact sheets. This information is packaged in a handy, onsite system record-keeping folder that the homeowner can use to track system maintenance, sketch the layout and position of the system, and record permit and local health department information.

WWPKPE28\$2.25

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WWPKPE28\$2.25

Homeowners Onsite System Recordkeeping Folder

Another useful product available from NESC. This folder provides a place to record and store information about your septic system and its maintenance. On the cover are sections for permit and local health department information. Inside are tips for locating your system, a safety checklist, and a section for recording the names, addresses, and certification numbers of your systems designer, installer, and pumper.

WWBLPE37\$1.45

"Alternative Household Cleaners" Brochure

This fact sheet provides less-toxic alternatives for several cleaning and home improvement jobs around the house.

GNFSPE109.....\$0.35

EPA's Source Water Protection Practices Bulletin Managing Septic Systems to Prevent Contamination of Drinking Water

This fact sheet discusses ways to prevent septic systems from contaminating sources of drinking water. It can be downloaded at www.nesc.wvu.edu/pdf/ww/septic/epa_septicwater_protection.pdf or ordered from NESC.

FSGN237\$1.00

Groundwater Protection Starts at Home Poster

This poster shows how household hazardous waste can contaminate groundwater. The back of the poster contains notes about household hazardous waste and disposal, as well as information about how to set up a household hazardous waste disposal program.

DWPSPE40..... Free

How to Order NESC Products

To place an order, call us toll free at (800) 624-8301 or (304) 293-4191. or send email to info@mail.nesc.wvu.edu. Be prepared to give the item number and title of the product you wish to order. Shipping charges will apply.



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Tips for Homeowners

Homeowner's Manual. It's full of good information for owners of onsite wastewater treatment systems of all kinds.

[Residential Solutions Home](#) | [Homeowner Basics](#) » [Choose a System](#) » [Customers](#) » [Sales Resources](#) » [Ask A Question](#) |

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INSIDE THE HOUSE - Disposal Guidelines

There are a number of do's and don'ts that will help ensure a long life and minimal maintenance for your system. As a general rule, nothing should be disposed into any wastewater system that hasn't first been ingested, other than toilet tissue, mild detergents, and wash water. Here are some additional guidelines.

Don't flush dangerous and damaging substances into your wastewater treatment system. (Please refer to "Substitutes for Household Hazardous Waste," below.) Specifically, do not flush . . .

- Pharmaceuticals
- Excessive amounts of bath or body oils
- Water softener backwash
- Flammable or toxic products
- Household cleaners, especially floor wax and rug cleaners
- Chlorine bleach, chlorides, and pool or spa products
- Pesticides, herbicides, agricultural chemicals, or fertilizers

Don't use special additives that are touted to enhance the performance of your tank or system. Additives can cause major damage to other areas in the collection system. The natural microorganisms that grow in your system generate their own enzymes that are sufficient for breaking down and digesting nutrients in the wastewater.

Do collect grease in a container and dispose with your trash. And avoid using garbage disposals excessively. Compost scraps or dispose with your trash, also. Food by-products accelerate the need for septage pumping and increase maintenance.

Do use your trash can to dispose of substances that cause maintenance problems and/or increase the need for septage pumping. **Don't ever** flush the following down the drain:

- Egg shells, cantaloupe seeds, gum, coffee grounds
- Tea bags, chewing tobacco, cigarette butts
- Condoms, dental floss, sanitary napkins, diapers
- Paper towels, newspapers, candy wrappers
- Rags, large amounts of hair
- Baby wipes, medicated wipes, cleaning wipes, and wipes made of non-biodegradable material

Don't plumb water softener discharge brine into your wastewater system. (The softened WATER is OK, just not the BRINE that's produced during the regeneration cycle.) **Do** route the brine around your wastewater system so it discharges directly into the soil. This is a cost-effective solution that ensures the long-term performance of your system and the biological processes that occur inside it.

Water softener brine interferes with nitrogen removal. And it degrades treatment by interfering with the settling process inside the tank. Without proper settling, solids, grease, and oils are carried through your system, clogging components. This increases your costs by...

- Requiring the tank to be pumped more often (at hundreds of dollars per pumpout)
- Requiring filters to be cleaned more often
- Fouling drainfields and other downstream equipment

Do keep lint out of your wastewater treatment system by cleaning the lint filters on your washing machine and dryer before every load. Installing a supplemental lint filter on your washing machine would be a good precautionary measure. (This normally takes just a few minutes. Lint and other such materials can make a big difference in the frequency and cost

INSIDE THE HOUSE - Water Use Guidelines

Don't ignore leaky plumbing fixtures; repair them. A leaky toilet can waste up to 2,000 gallons (7,500 liters) of water in a single day. That's 10-20 times more water than a house-hold's typical daily usage. Leaky plumbing fixtures increase your water bill, waste natural resources, and overload your system.

Don't use excessive amounts of water. Using 50 gallons (200 liters) per person per day is typical. If your household does not practice any of the "water conserving tips" below, you may be using too much water:

- Take shorter showers or take baths with a partially filled tub. Be cautious about excessive use of large soaking tubs.
- Don't let water run unnecessarily while brushing teeth or washing hands, food, dishes, etc.
- Wash dishes and clothes when you have a full load.
- When possible, avoid doing several loads in one day.
- Use water-saving devices on faucets and shower heads.
- When replacing old toilets, buy low-flush models.

Don't leave interior faucets on to protect water lines during cold spells. A running faucet can easily increase your wastewater flow by 1,000 to 3,000 gallons (4,000 to 12,000 liters) per day and hydraulically overload your system. Instead, properly insulate or heat your faucets and plumbing.

OUTSIDE THE HOUSE

Don't enter your tank, ever! Gases that can be generated in the tank and/or oxygen depletion can be fatal.

Do keep the tank access lid fastened to the riser at all times with stainless steel lid bolts. If the bolts are lost or damaged, call your service provider immediately for bolts. Or call Orenco at (800) 348-9843 or +1 (541) 459-4449. If the tank lid becomes damaged, **BLOCK ACCESS TO THE TANK OPENING IMMEDIATELY AND KEEP CHILDREN AWAY** until all repairs are made.

Don't dig without knowing the location of your wastewater system. As much as possible, plan landscaping and permanent outdoor structures before installation. But easily removable items, such as bird baths and picnic tables, are OK to place on top of your system.

Don't drive over your tank or any buried components in your system, unless it's been equipped with a special traffic lid. If the system is subject to possible traffic, put up a barricade or a row of shrubs.

Don't dump RV waste into your wastewater system. It will increase the frequency of required septage pumping. When dumped directly into the pumping vault, RV waste clogs or fouls equipment, causing undue maintenance and repair costs. (Also, some RV waste may contain chemicals that are toxic or that may retard the biological digestion occurring within the tank.)

Don't ever connect rain gutters or storm drains to the sewer or allow surface water to drain into it. And don't discharge hot-tub water into your system. The additional water will increase costs, reduce the capacity of the collection and treatment systems, and flood the drainfield. It can also wash excess solids through the tank.

AT THE CONTROL PANEL

of pumping out your septic tank.)

Do use substitutes for household hazardous waste. Replace the following hazardous products with products that are less environmentally harmful. The hazardous cleaners are listed below, followed by the suggested substitute:

Ammonia-based cleaners	For surfaces, sprinkle baking soda on a damp sponge. For windows, use a solution of 2 Tbs. (30 mL) white vinegar to 1 qt. (1 L) water. Place the mixture into the spray bottle.
Disinfectants	Use borax: 1/2 cup in a gallon of water; deodorizes also.
Drain decloggers	Use a plunger, metal snake, or remove and clean trap.
Scouring cleaners and powders	Sprinkle baking soda on a damp sponge or add 4 Tbs. baking soda to 1 qt. warm water or use Bon Ami. It's cheaper and won't scratch.
Carpet and Upholstery cleaners	Sprinkle dry cornstarch or baking soda on, then vacuum. For tougher stains, blot with white vinegar in soapy water.
Toilet cleaners	Sprinkle on baking soda or Bon Ami, then scrub with a toilet brush.
Furniture and floor polishes	To clean, use oil soap and warm water. Dry with soft cloth. Polish with 1 part lemon juice and 2 parts oil (any kind), or use natural products with lemon oil or beeswax in mineral oil.
Metal cleaners	Brass and copper: scrub with half lemon dipped in salt. Stainless steel: use scouring pad and a soft wet cloth.
Oven cleaners	Quickly sprinkle salt on drips, then scrub. Use baking soda and scouring pads on older spills.
Laundry detergents	Choose one with a zero phosphate content.

IMPORTANT CAUTION!

Only a qualified electrician or authorized installer/operator should work on your control panel. Before anyone does any work on either the wiring to the level control floats and pumps in the vault or the control panel itself, it is imperative to first switch the isolation fuse/breaker and the circuit breakers in the panel to the "Off" positions, then switch "Off" the power to the system at the main breaker!

Do locate your electrical control panel where it will be protected from potential vandalism and have unobstructed access.

Do familiarize yourself with the location of your wastewater system and electrical control panel. Refer to the panel's model and UL number (inside the door) when reporting a malfunction in the system.

Do remember that the audible alarm can be silenced by pushing the lighted button located directly above the "Push to Silence" label on the front of the electrical control panel. Hold the button until the alarm goes off. With normal use, the tank has a reserve storage capacity good for about 24 hours.

Don't turn off the main circuit breaker to the wastewater pumps when going on vacation. If there is any infiltration or inflow into the system, the pumps will need to handle it.

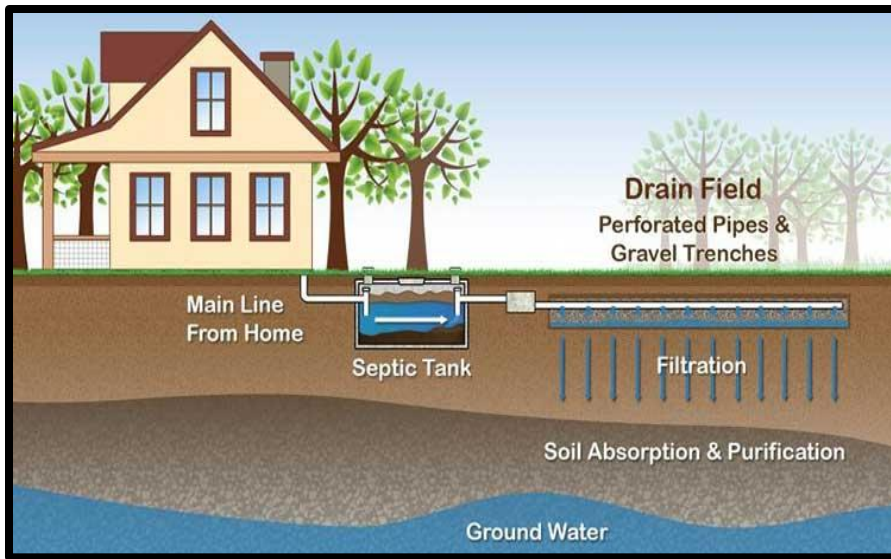
FOR ROUTINE MAINTENANCE

Do make arrangements with a reliable service person to provide regular monitoring and maintenance. Place the service person's phone number on or in your control panel!

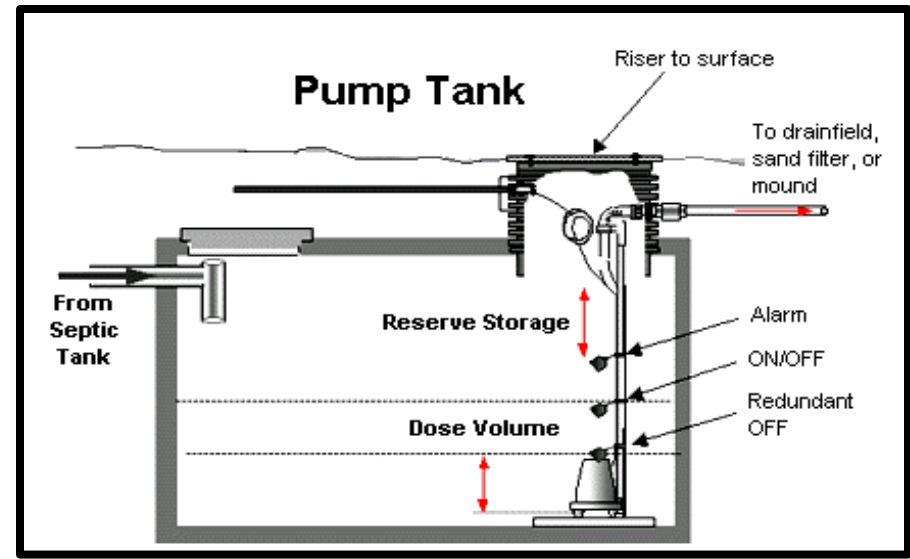
Do keep a file copy of your service provider's sludge and scum monitoring report and pumpout schedule. This information will be beneficial for real estate transactions or regulatory visits.

Do keep an "as built" system diagram in a safe place for reference.

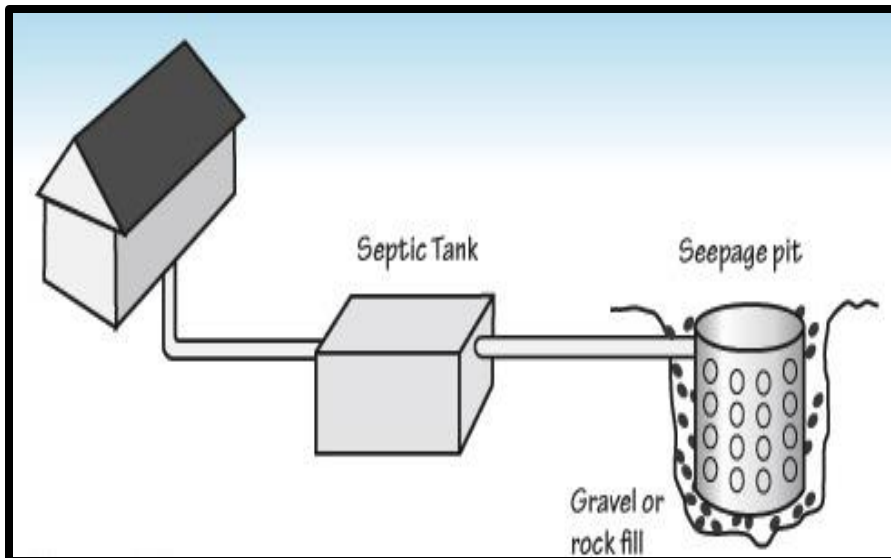




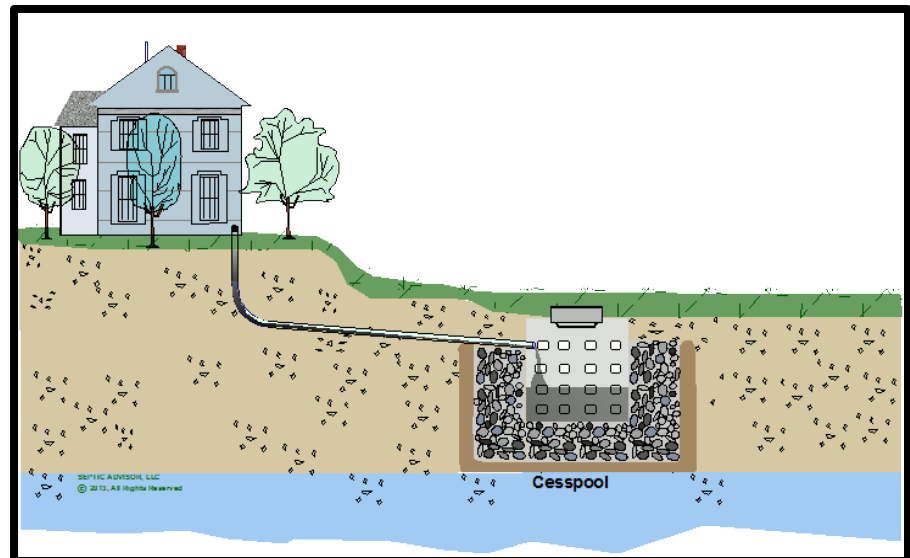
Standard Septic Tank and Leachfield



Pump System – From Septic Tank to Leachfield

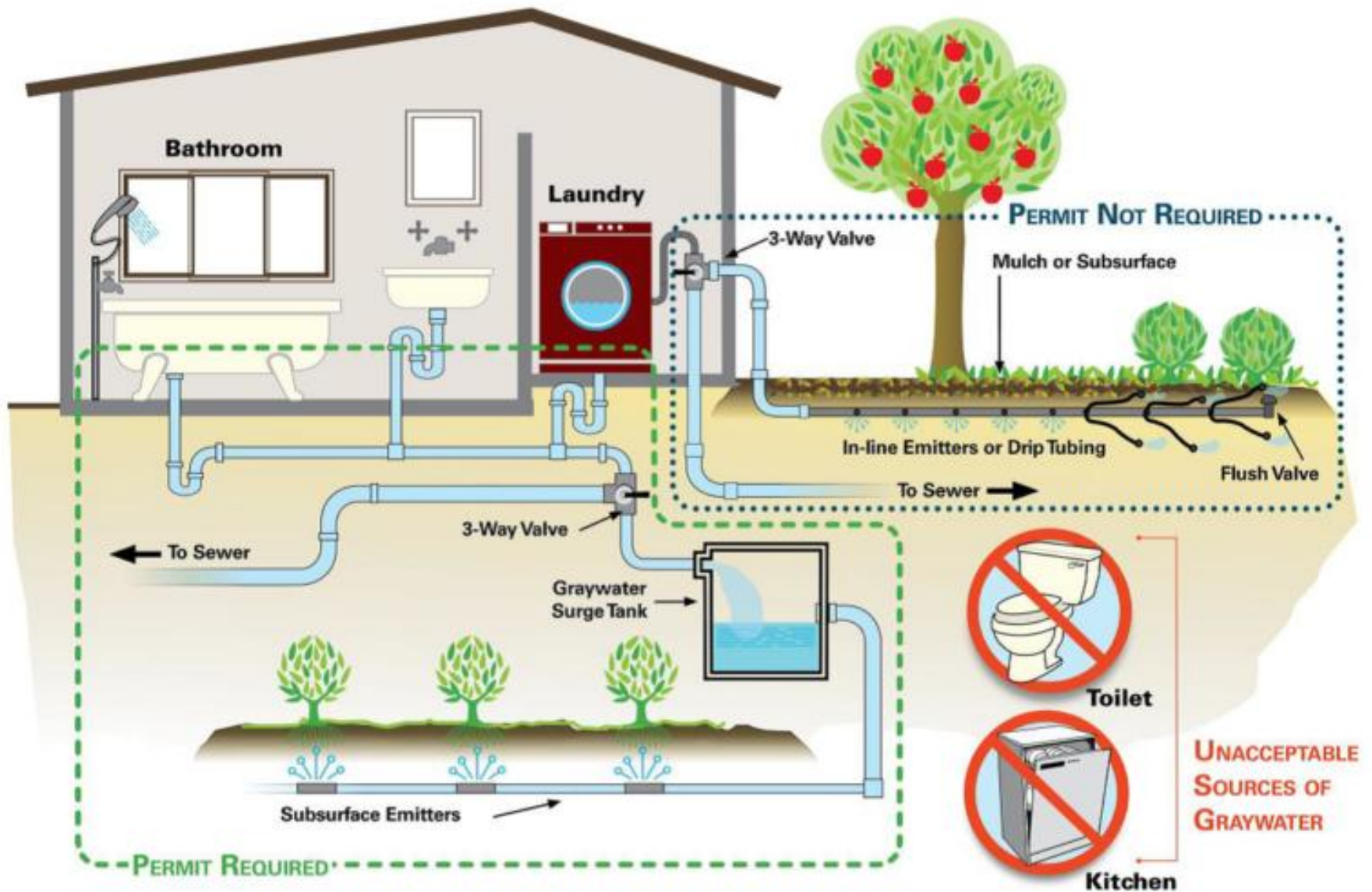


Septic Tank and Seepage Pit

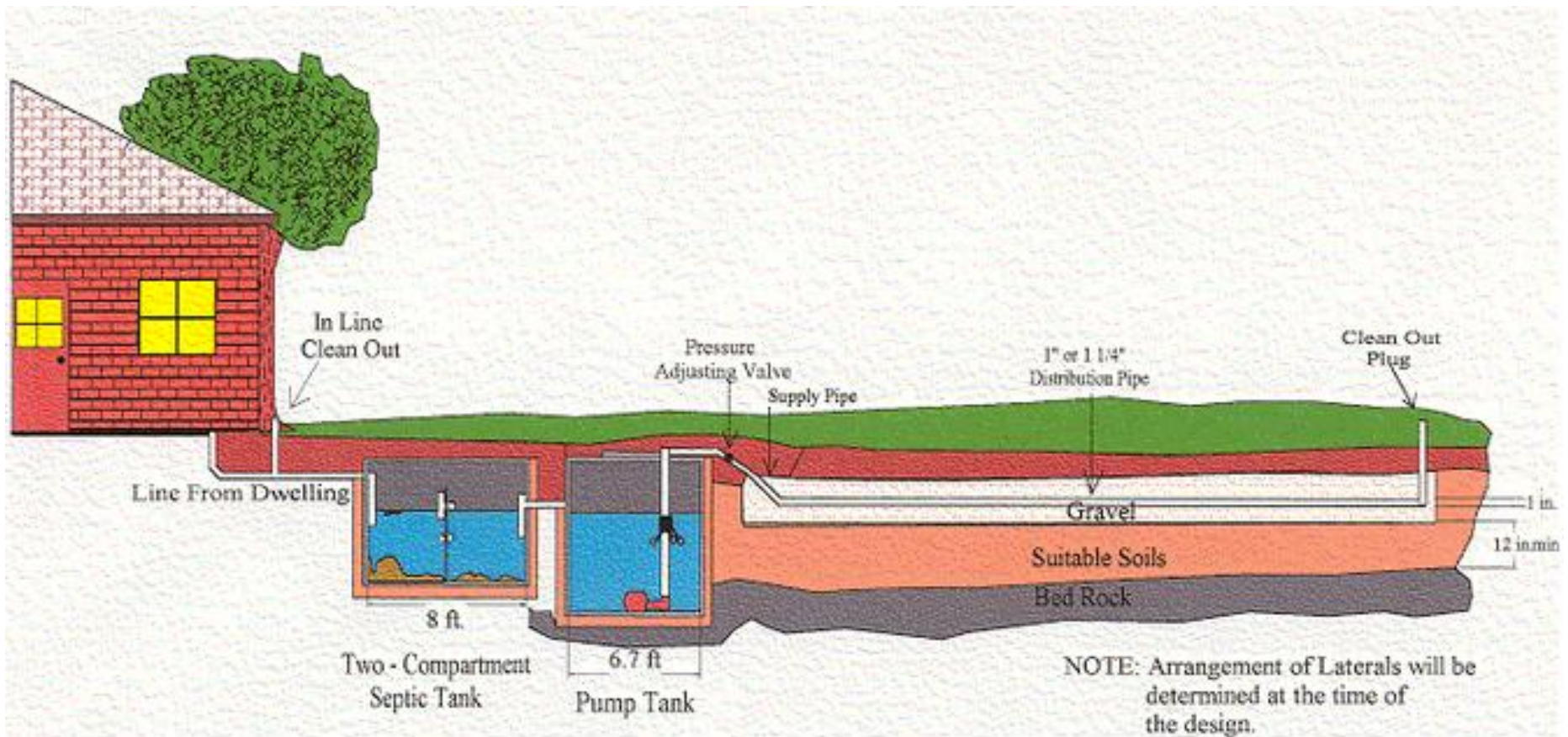


Cesspool

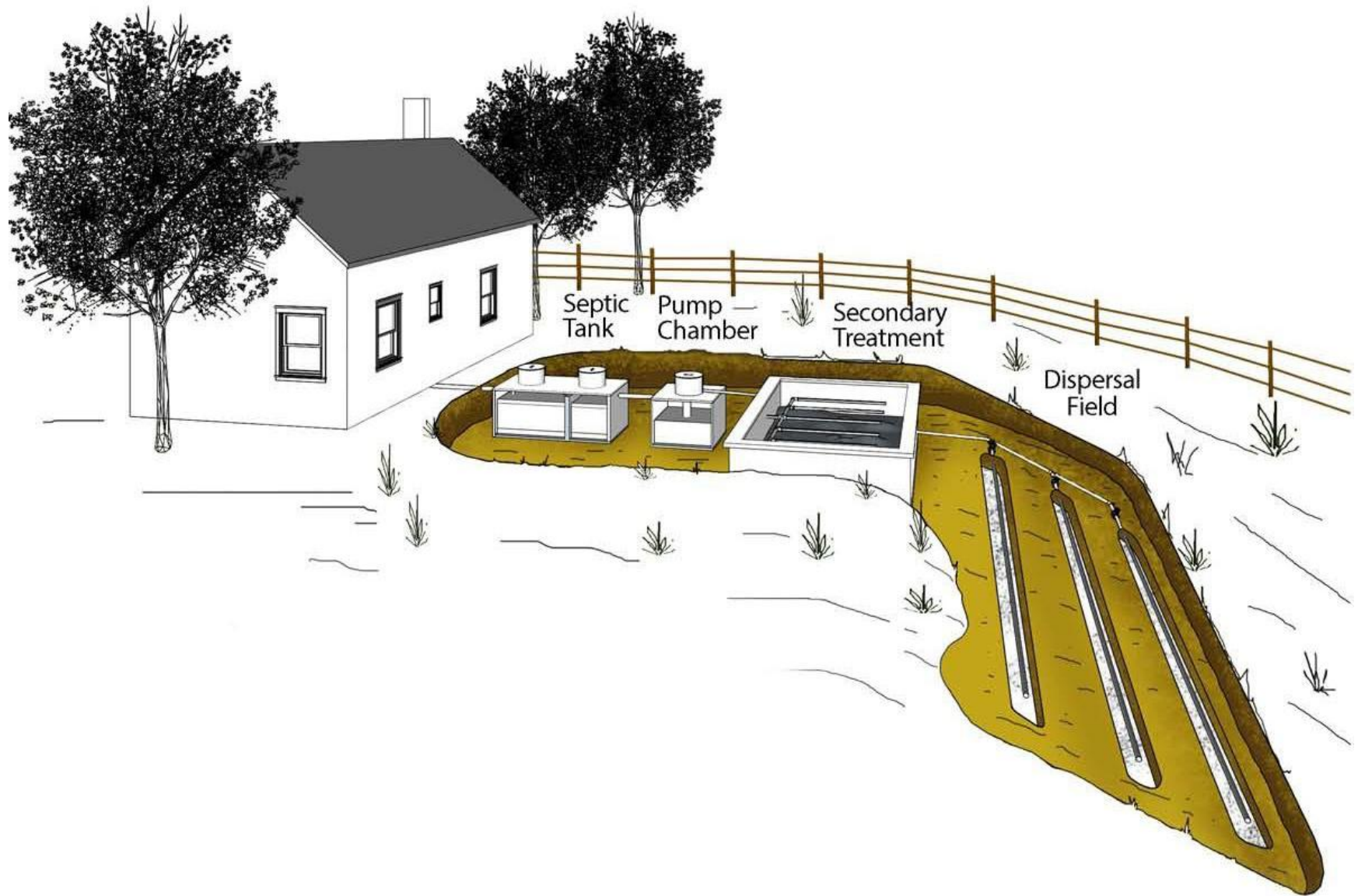
SAMPLE RESIDENTIAL GRAYWATER SYSTEMS



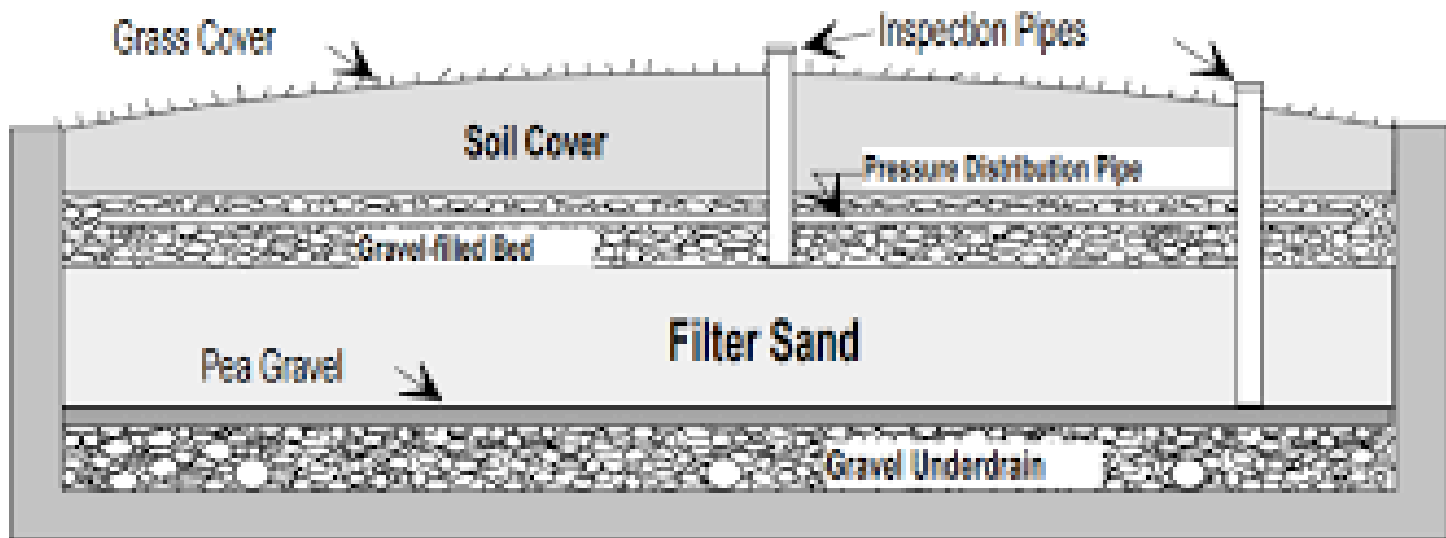
Source: City of San Diego



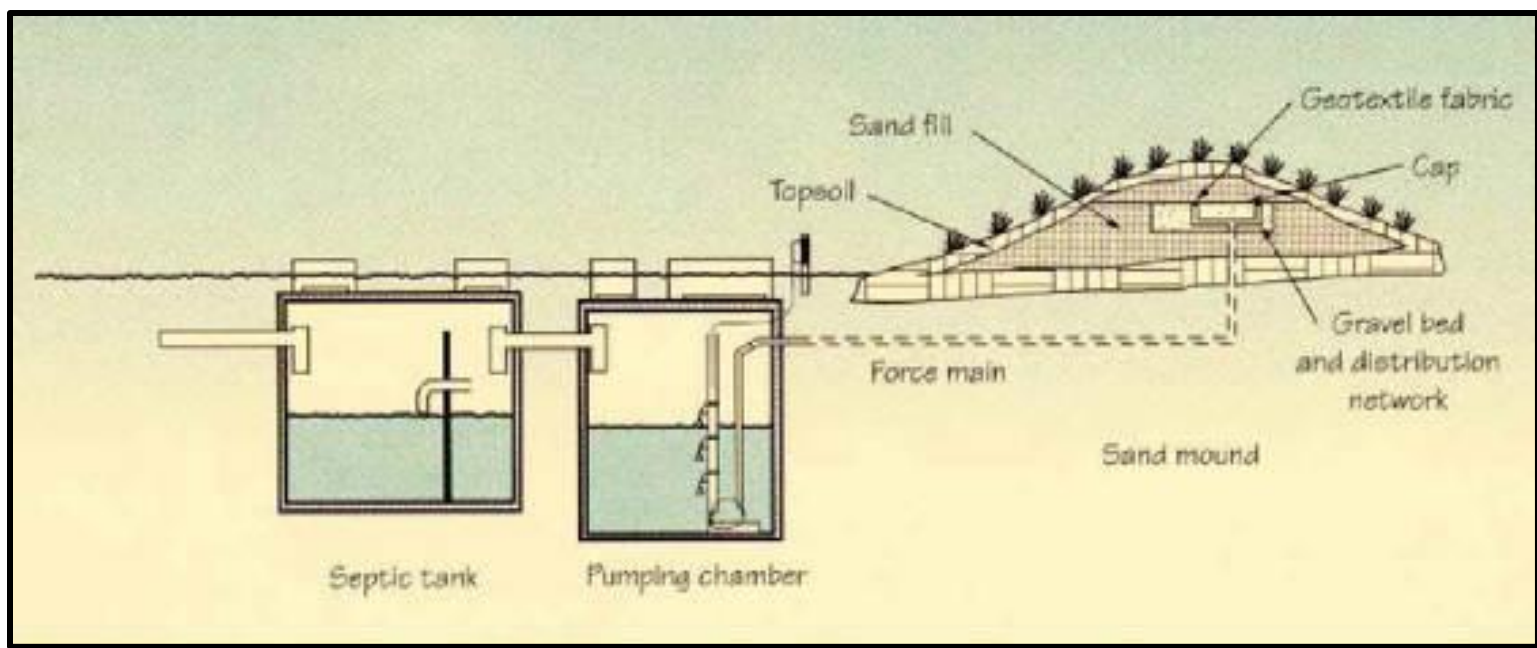
Shallow Pressure Distribution Trench Dispersal



Advanced Treatment with Shallow Trench Dispersal

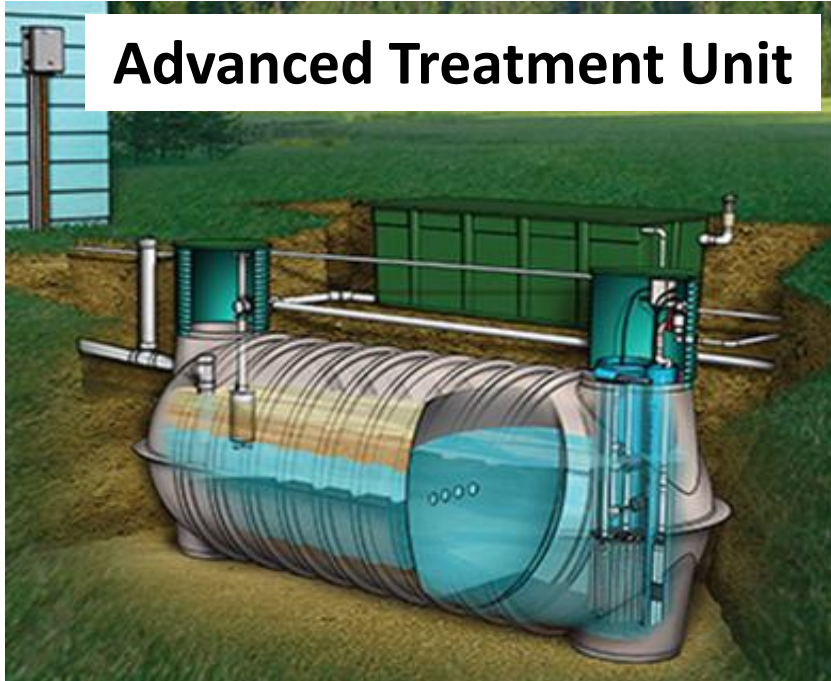


Intermittent Sand Filter



Mound System

Advanced Treatment Unit



Subsurface Drip Dispersal

Shallow Dripline

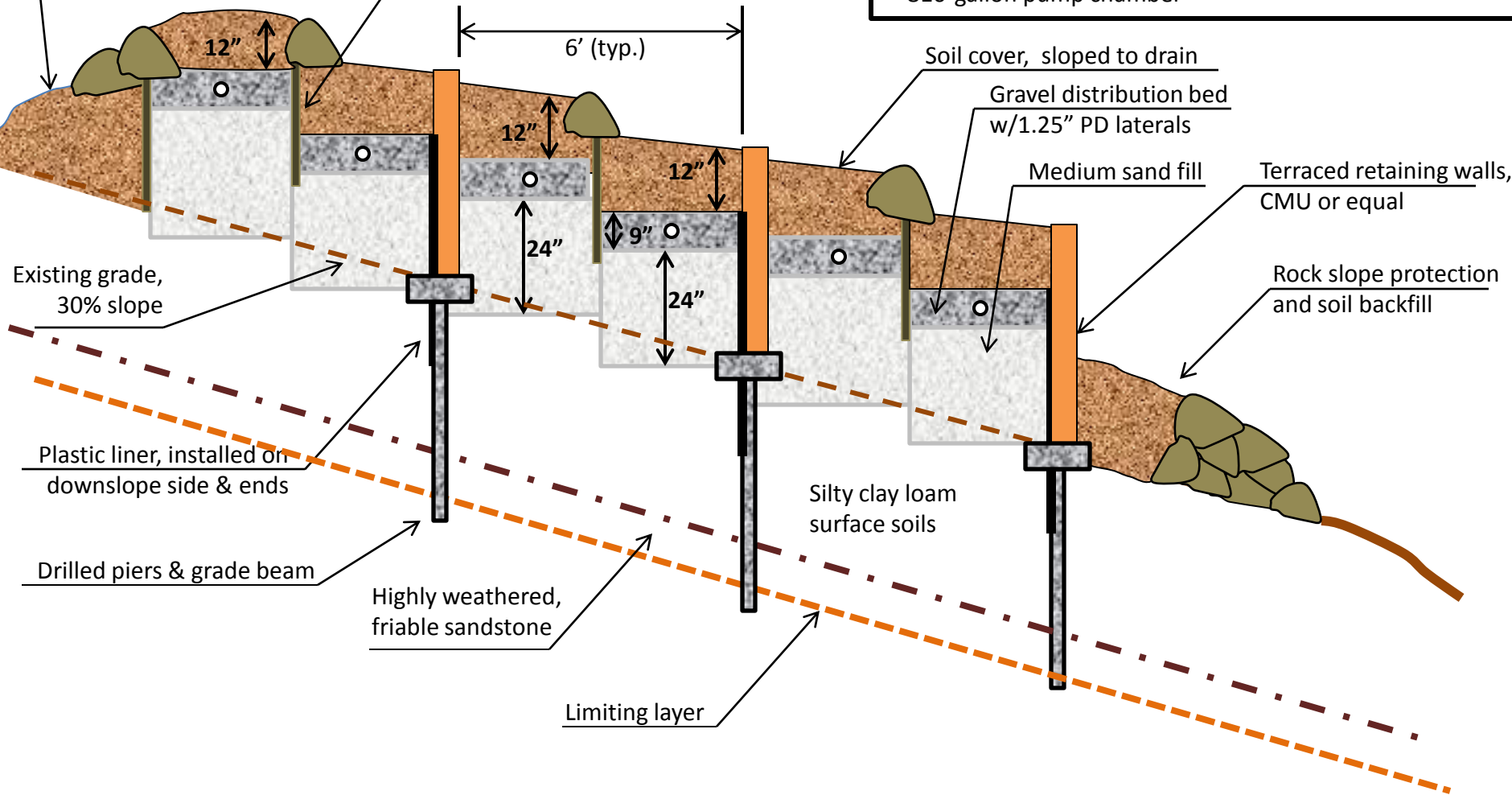


Soil transition to upslope landscape,
w/grading and drainage as needed

$\frac{3}{4}$ " pressure treated plywood
batter board w/plastic liner,
installed full length each bed to
form center divider between
stepped distribution beds

Design Elements:

- (3) Terraced beds, 6' wide by 17' long; pressure dosed
- Each bed divided into two steps, 11" rise to minimize soil excavation, maximize effective soil depth.
- $306 \text{ ft}^2 @ 1.2 \text{ gpd/ft}^2 = 364 \text{ gpd capacity}$;
- 1,200-gallon septic tank w/large capacity effluent filter
- 810-gallon pump chamber



**Side Yard Raised Sand Filter Bed
Kilkare Road, Sunol**