HOLDING TANK COMPONENT MANUAL
FOR PRIVATE ONSITE WASTEWATER TREATMENT SYSTEMS
(VERSION 2.1)

May 2022
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State of Wisconsin
Department of Safety & Professional Services
Division of Industry Services

HOLDING TANK COMPONENT MANUAL
FOR PRIVATE ONSITE WASTEWATER TREATMENT SYSTEMS (POWTS)
(VERSION 2.1)

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I. INTRODUCTION AND SPECIFICATIONS

This Private Onsite Wastewater Treatment System (POWTS) component manual provides design, construction, inspection, operation, and maintenance specifications for a prefabricated or site constructed holding tank component that has a current plumbing product approval from the Department. Site constructed holding tank components that do not have plumbing product approval must be submitted as an individual site design. Violations of this manual constitute a violation of chapters SPS 383 and 384, Wis. Adm. Code. Design variations of this manual will constitute an "Individual Site Design" which require exclusive plan review conducted by state staff.

Note: Detailed plans and specifications must be developed and submitted for review and approval to the governing unit having plan review authority. In addition, a state Sanitary Permit must be obtained from the department or governmental unit having jurisdiction. See Section VII for more details.

Table 1
SIZE AND LOCATION

Holding capacity	≥ 5 times estimated daily wastewater flow or 2000 gals, whichever is greater
Horizontal setback distances	Meet s. SPS 383.43 (8) (i), Wis. Adm. Code
Location of service access opening	≤ 25 feet to an all-weather road measured from the furthest service access opening or pump out port.

Table 2
OTHER SPECIFICATIONS

Tank design and construction	Meets s. SPS 384.25, Wis. Adm. Code
Alarm or warning system	Meets s. SPS 383.43(8)(e)2. and s. SPS 384.25 (10), Wis. Adm. Code
Metering	When specifically required, meets s. SPS 383.54 (2), Wis. Adm. Code
Installation in soils that indicate periodic or constant saturation.	Meets s. SPS 383.43 (8) (g), Wis. Adm. Code.
Installation inspection	In accordance with ch. SPS 383, Wis. Adm. Code
Management	In accordance with ch. SPS 383, Wis. Adm. Code and this manual
Piping materials for vents	≥ 2" I.D. pipe constructed of materials listed in ch. SPS 384, Table 384.30-1, Wis. Adm. Code.
Vent Location and Orientation	Meets s. SPS 382.31(16)(d)2. and s. SPS 383.45(6)(b), Wis. Adm. Code. Vent openings are oriented down.

II. DEFINITIONS.

Definitions not found in this section are located in chapter SPS 381, Wis. Adm. Code, or the terms use the standard dictionary definition.

1. "Service provider" means the individual or company that is responsible for inspecting, maintaining, or servicing the holding tank system.
2. "All-weather road" means a gravel or paved surface that can support a fully loaded pump truck in all seasons.
3. "Individual Site Design" means a system that does not fully comply with the design standards of this component manual (ISD).

III. DESCRIPTION AND PRINCIPLE OF OPERATION

The POWTS holding tank serves to contain wastewater or sewage on site until the contents are pumped and hauled to a proper point of disposal. Pumping and monitoring reports are submitted to the governmental unit or designated agent.

The holding tank installed under this component manual holds domestic wastewater, stormwater or clearwater inclusions permitted under s. SPS 382.36, Wis. Adm. Code, until pumped by an individual certified as a septage servicing operator under ch. NR 114, Wis. Adm. Code. See Figure 1 for an example of a typical holding tank.

Industrial wastewater is regulated by the Department of Natural Resources (DNR), and is not included in this specification, unless approved by the DNR in advance. Any facility creating non-domestic wastewater may require concurrence approval from the DNR. Please check with a state plan reviewer if there are any questions.

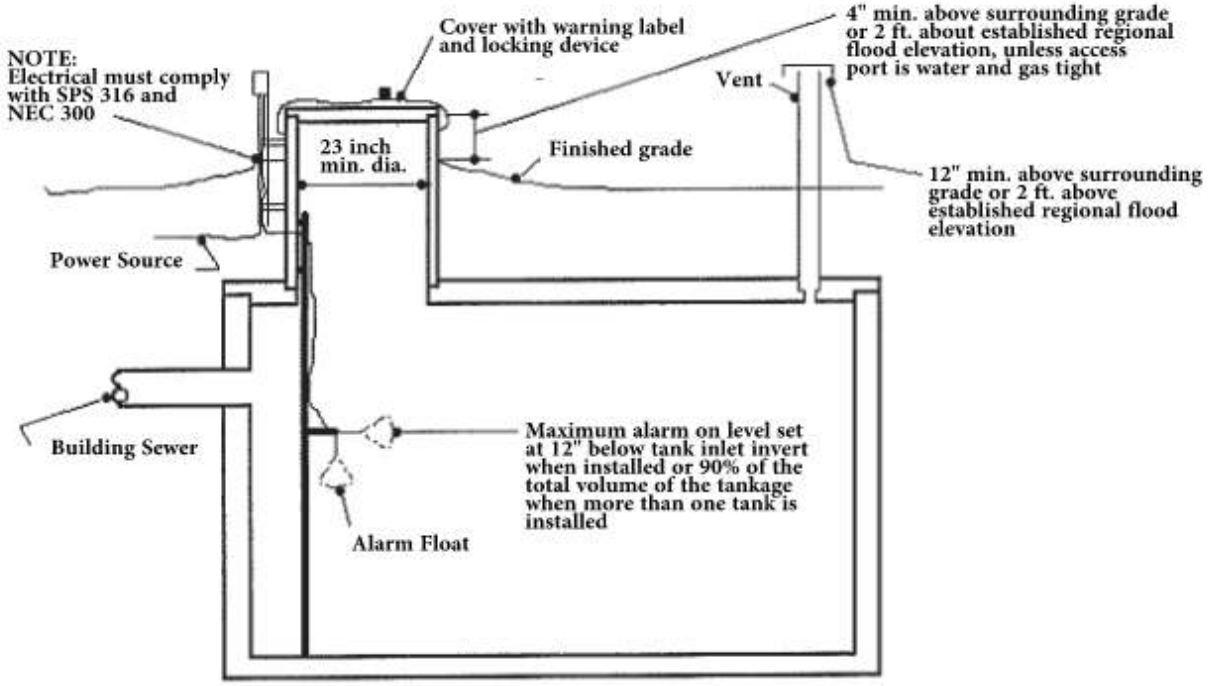


Figure 1 – Cross-section of Holding Tank

IV. DESIGN

A. Tank Size:

1. One- and Two-family Dwellings. The minimum liquid capacity of a holding tank for one- and two-family dwelling applications shall not be less than 2000 gallons or 5 times the estimated daily wastewater flow determined in accordance with s. SPS 383.43(3), (4), or (5), Wis. Adm. Code, whichever is greater.

2. Public Facilities. The minimum liquid capacity of a holding tank for public facilities shall not be less than 2000 gallons or 5 times the estimated daily wastewater flow determined in accordance with s. SPS 383.43(6), Wis. Adm. Code. Facilities not listed in s. SPS 383.43(6), Wis. Adm. Code can be discussed with the plan reviewer to establish an acceptable daily flow rate volume.

B. Tank Anchoring:

When a holding tank may be installed in saturated soils (see ch. SPS 385, Wis. Adm. Code, for information on how to determine soil saturation) and/or in an area that is considered part of a flood plain, the tank shall meet the provisions of s. SPS 383.43(8)(g), Wis. Adm. Code.

See chapter SPS 383, Wis. Adm. Code, Appendix for examples of anchoring calculations.

C. Monitoring/Management Equipment:

The alarm for the holding tank installation is an audible and/or visual alarm installed in a conspicuous location in or on the building served or on a post near the tank. The alarm is connected to a float switch or other electrical sensor in the holding tank. The maximum alarm on level is set at 12 inches below the tank inlet when only one tank is used or 90% of the total volume of the tankage when more than one tank is used.

V. SITE PREPARATION AND CONSTRUCTION

A. Sanitary Permit:

Prior to the construction of the system, a state sanitary permit shall be obtained and posted in a clearly visible location on the site. Arrangements for inspection(s) must be made with the governmental unit that issues the state sanitary permit. When a POWTS is located or will be located on property owned by the state, the sanitary permit shall be obtained from the department. Arrangements for inspection(s) shall be made with the department.

B. Site Preparation and Tank Installation:

The holding tank must be installed in accordance with the manufacturer's printed instructions, product approval, plan approval and specifications in this component manual. If there is a conflict between the manufacturer's instructions and the product approval, plan approval and/or component manual specifications, the product approval, plan approval and/or component manual specifications take precedence.

1. The tank shall be set level. (Refer to tank manufacturer’s recommendations for bedding and backfill listed in tank approval letter.)

2. Access openings that terminate at grade and/or less than 2 ft. above the established regional flood elevation (if applicable) must have watertight access openings. Access openings that

terminate at least 4 inches above the surrounding grade and 2 ft. above the established regional flood elevation (if applicable) are not required to have watertight access openings.

3. Access opening covers that terminate at or above grade may be provided with a service port that is 8 inches inside diameter. The reduced opening must have a locking device or a brass cleanout plug. Service ports larger than 8 inches inside diameter must have a locking device in accordance with s. SPS 384.25(7)(h), Wis. Adm. Code.
4. All access openings shall be located as to permit a minimum of 3 feet of clear space above the opening and 2 feet in all directions horizontally from any point of the access opening for purposes of inspection, maintenance or servicing. Access openings within 10 feet of any building shall also be gas tight.
5. The connection of the holding tank to the sanitary sewer shall be by means of a mechanical joint, solvent cement joint or other joint conforming to s. SPS 384.40, Wis. Adm. Code.
6. Below grade connections. Joints between the tank, access opening risers, and covers shall be watertight.

C. Alarm Equipment Installation:

The alarm switch shall be set to activate an alarm when liquid volume is 12" below the tank inlet invert or at 90% of the liquid capacity of the tank below the tank inlet invert. All wiring shall be installed in accordance with National Electrical Code (NEC) Article 300 and s. SPS 316.23, Wis. Adm. Code.

D. Backfill:

The holding tank excavation is backfilled as per manufacturer instructions with sufficient soil material to divert surface water runoff away from the tank location.

VI. OPERATION, MAINTENANCE AND PERFORMANCE MONITORING

A. Owner is Responsible:

The POWTS owner is responsible for the operation and maintenance of the POWTS locking device, alarm, and access opening. The owner or owner's agent is required to submit reports as required by s. SPS 383.55 (1), Wis. Adm. Code, to the governmental unit or designated agent.

B. Approvals and Inspections:

Design approval and site inspections before, during and after construction are conducted by the governmental unit or other appropriate jurisdiction(s) in accordance with ss. SPS 383.22 and 383.26, Wis. Adm. Code.

C. Performance Expectations:

1. Maintenance cycle. The holding tank must be serviced by certified septage operators (pumpers). An alarm system must be installed to activate when the liquid level in a single

tank is within 12 inches of the inlet invert or when the total volume of the tankage of multiple tanks reaches 90%.

2. Performance monitoring. Within 30 calendar days from the date of an inspection, maintenance or servicing event, the owner of the POWTS or the owner's agent shall file a report with the governmental unit or designated agent.

D. User's Manual:

A user's manual shall accompany the POWTS component and be provided to the owner following installation. At a minimum, the manual shall contain the following information:

1. Diagram(s) of all components and their locations.
2. Names and phone numbers of local governmental unit authority, component manufacturer or POWTS service provider to be contacted in the event of component failure or malfunction.
3. A management plan that contains information on the periodic inspection, maintenance or servicing of the component, including electrical/mechanical components.

VII. PLAN SUBMITTAL AND INSTALLATION INSPECTION

A. Plan Submittal:

In order to install a POWTS correctly, it is important to develop plans that will be used to guide the installation. The following checklist may be used when preparing plans for review. Conformance to the list is not a guarantee of plan approval. Additional information may be needed or requested to address unusual or unique characteristics of a particular project. Contact the reviewing agency for specific plan submittal requirements, which may be different than the list included in this manual.

B. General Submittal Information:

1. Legible photocopies of reports, forms, plans, and other documents are acceptable. However, an original signature is required on certain documents (e.g. index page).
2. Submittal of additional information requested during plan review or questions concerning a specific plan must be referenced to the identification number assigned to that plan by the reviewing agency.
3. Plans or documents must be permanent, legible copies or originals.

C. Forms and Fees:

A current version of a completed Application For Review form, (SBD-10577) along with proper fees must be included with plans submitted to the department. If plans are to be submitted to a local governmental unit, the appropriate reviewer should be contacted for information regarding application forms and fees.

D. Soils Related Information:

1. A holding tank is a component that does not utilize in situ soil for treatment or dispersal of wastewater; therefore a soil test is not required per s. SPS 383.44 (1), Wis. Adm. Code.

2. Pertinent flood plain areas and OHWM designations of navigable waters of the state shall be shown on a soil test and/or the system plot plan.
3. A soil test may be required (one borehole at tank location) for the evaluation of saturated soil depths if tank anchoring is a concern.
4. Section SPS 383.32(2), Wis. Adm. Code, allows municipalities to prohibit or limit holding tanks. These municipalities may require a complete soil test by ordinance to verify that a holding tank is the only option available.

E. Documentation Requirements:

1. Architects, engineers, or designers shall sign, seal and date each page of the submittal or sign, seal and date an index page, which is attached to the bound set.
2. Master Plumbers and Master Plumbers-Restricted Service shall, sign, date and include their license number on each page of the submittal or sign and date an index page which is attached to each bound set.
3. A detailed project description must be submitted with all commercial plans. Any facility creating non-domestic wastewater may require concurrence approval from the WI. DNR. Please check with a state plan reviewer if there are any questions.
4. Submittals, if paper, must measure at least 8-1/2 by 11 inches.
5. Designs that are based on department approved component manual(s) must include reference to the manual by name, publication number and published date.

F. Plot Plan Information:

1. Dimensioned plans or plans drawn to scale (scale indicated on plans) with property lines, parcel size, and property boundaries clearly marked.
2. Benchmark and north arrow.
3. Elevations when the bottom of the furthest tank is proposed to be located more than 15 feet below the elevation where the all-weather road is to be provided.
4. Information showing that the access opening of the furthest tank is located not more than 25 feet horizontally from where the all-weather road is to be provided.
5. Pertinent existing and proposed buildings, wells, water lines, swimming pools, flood plain location and elevation and OHWM designations of navigable waters.
6. Location information; legal description (down to 40 acres and/or subdivision), block and lot number of platted lands.

G. System Sizing:

1. For one- and two-family dwellings the number of bedrooms shall be included.
2. For public facilities, the sizing calculations shall be included. Public facility estimated daily wastewater flows can be found in s. SPS 383.43(6), Wis. Adm. Code. Facilities not listed in s. SPS 383.43(6), Wis. Adm. Code can be discussed with the plan reviewer to establish an acceptable daily flow rate volume. A detailed project description must be submitted with all commercial plans.

H. Tank Information:

1. Construction details for site-constructed tanks. (Note: site constructed tanks that do not have a valid plumbing product approval are not included within the scope of this manual and must be submitted as individual site designs)
2. Size, model number and manufacturer information for prefabricated tank(s).
3. Installation information must include vent and access opening locations, depth to inlet; and height/elevation of freeboard, if applicable.
4. Anchoring information shall be provided whenever a tank is located within the floodplain and/or the depth to seasonal soil saturation indicates anchoring is necessary to prevent flotation of the tank.
5. Cross section of tank (or tanks to be installed in series), with information regarding liquid depth, depth of high water alarm, approved joints and any modifications (suction pipes, etc.) clearly marked.

I. Septage Disposal:

Estimated daily wastewater flows greater than 3,000 gpd, shall include information pursuant to s. NR 113.07(1)(e), Wis. Adm. Code. Written notification from the Department of Natural Resources shall be provided confirming agreement from a publicly owned treatment work to accept the contents from the holding tank.

A confirmation agreement from a publicly owned wastewater treatment plant to accept the contents from the holding tank shall also be included if the facility is designated to be "At-Risk" or produces High-Strength wastewater.

J. Inspections:

Inspection(s) shall be made in accordance with ch. 145.20, Wis. Stats., and s. SPS 383.26, Wis. Adm. Code. The inspection form found on the DSPS POWTS website may be used. The inspection of the POWTS installation is to verify that the POWTS conforms to specifications listed in Tables 1 and 2 of this manual and the approved plans.

Department of Safety and Professional Services
Division of Industry Services
Plumbing Product Review
4822 Madison Yards Way
P.O. Box 7162
Madison, Wisconsin 53707-7162
Phone 608-266-2112
Web http://dsps.wi.gov
Email dsps@wisconsin.gov
TTY: Contact Through Relay

May 31, 2022

Dept. of Safety and Professional Services
Bureau of Technical Services
Division of Industry Services
Brad Johnson - Section Chief
4822 Madison Yards Way
Madison WI 53705

Re: Description: POWTS Component Manual
Manufacturer: Dept. of Safety and Professional Services
Product Name: Holding Tank Component Manual for Private Onsite Wastewater Treatment Systems (Version 2.1); (May 2022-2027)
Model Number(s): v. 2.1
eSLA PTO No.: PP-081700081-PTOVPCR

The specifications and/or plans for this plumbing product have been reviewed and determined to comply with chapters SPS 382 through 384, Wisconsin Administrative Code, and Chapters 145 and 160, Wisconsin Statutes.

The Department hereby issues an approval based on the Wisconsin Statutes and the Wisconsin Administrative Code. This approval is valid until the end of May 2027.

This approval is contingent upon compliance with the following stipulation(s):

1. A copy of this approval letter shall be submitted with all plans using the Holding Tank Component Manual for Private Onsite Wastewater Treatment Systems (Version 2.1); (May 2022-2027)

   Plans submitted without a copy of this approval letter may be denied.

2. This approval recognizes that POWTS systems designed, installed and maintained in accordance with this manual will provide treatment and dispersal of domestic wastewater that is acceptable in the context of ch. 383 Wis. Adm. Code.

3. Systems installed in accordance with this POWTS Component Manual shall use wastewater tanks approved by the department. If a given tank is approved and meets the published specifications contained in the manual, then redundant approval of the tank is not required. The installation shall not compromise the structural integrity of the tank.

4. Systems installed in accordance with this POWTS Component Manual shall be installed, maintained and used in strict accordance with the manufacturer's published instructions, Chapters 381-387 Wis. Adm. Code and this product approval. If there is a conflict between the manufacturer's instructions and the Wis. Adm. Code or this Plumbing Product Approval, then the Wis. Adm. Code and this Plumbing Product Approval shall take precedence.

5. Complete operation and maintenance instructions POWTS systems designed in accordance with this manual shall be provided to each system owner and remain onsite.

6. Systems designed in accordance with this manual shall be installed by persons holding the proper license or registration in accordance with Wis. Stats. § 145.

7. Drain, waste and vent piping used to install these systems shall conform to s. SPS 384.30 (1), (2) and (3) Wis. Adm. Code.

8. Cleanouts shall be installed in drain piping associated with the installation of these systems in accordance with s. SPS 382.35 Wis. Adm. Code.

9. Commercial food processing, food production, food service, restaurants, taverns and similar establishments which may generate greases, fats, oils or similar substances; shall have state-approved grease interceptors installed upstream of POWTS systems designed in accordance with this manual in accordance with s. SPS 382.34 Wis. Adm. Code.

10. DSPS POWTS plan approval shall be obtained from the department's Private Sewage Section, or the appropriate agent county, for:

    a. each installation of POWTS systems designed in accordance with this manual; and
    b. high-strength and/or commercial POWTS systems designed in accordance with this manual.

11. A sanitary permit shall be obtained, in accordance with s. SPS 383.21 Wis. Adm. Code, from the county, or other local authority having jurisdiction, for each proposed installation of systems designed in accordance with this manual.

12. A complete and acceptable soil evaluation report, conforming to s. SPS 385.40 Wis. Adm. Code, shall be performed for all proposed systems designed in accordance with this manual.

Technical notations:

    a. This approval supersedes the approval issued August 15, 2017 under product file no. 20170216.

he department is in no way endorsing this product or any advertising and is not responsible for any situation which may result from its use.

Sincerely,

Brad Johnson – Section Chief
Department of Safety and Professional Services
Bureau of Technical Services
Division of industry Services
Phone: 920 492-5605
Email: Bradley.Johnson@Wisconsin.gov

Do your Part—
Be SepticSmart!

A Homeowners' Guide to Septic Systems

septicsmart™

U.S. Environmental Protection Agency

EPA

Maintaining Your Septic System:

Good for your wallet. Good for your health. Good for the environment.

Did you know that one-quarter of all U.S. homes have septic systems? Yours may be one of them. If you're not properly maintaining your septic system, you're not only hurting the environment, you're putting your family's health at risk—and may be flushing thousands of dollars down the drain!

First Things First:

What Is a Septic System?

Common in rural areas without centralized sewer systems, septic systems are underground wastewater treatment structures that use a combination of nature and time-tested technology to treat wastewater from household plumbing produced by bathrooms, kitchen drains, and laundry.

Do You Have a Septic System?

You may already know you have a septic system. If you don't know, here are tell-tale signs that you probably do:

- You use well water.
- The waterline coming into your home doesn't have a meter.
- You show a "$0.00 Sewer Amount Charged" on your water bill.
- Your neighbors have a septic system.

How To Find Your Septic System

Once you've determined that you have a septic system, you can find it by:

- Looking on your home's "as built" drawing.
- Checking your yard for lids and manhole covers.
- Contacting a septic inspector/pumper to help you locate it.

Why Should You Maintain Your Septic System?

Maintaining Your Septic System…

Saves You Money

Regular maintenance fees of $250 to $300 every three to four years is a bargain compared to the cost of repairing or replacing a malfunctioning system, which can cost between $3,000 and $7,000. The frequency of pumping required for your system depends on how many people live in your home and the size of the system.

Protects Your Property Value

An unusable septic system or one in disrepair will lower your property value, not to mention pose a potentially costly legal liability.

Keeps You and Your Neighbors Healthy

Household wastewater is loaded with disease-causing bacteria and viruses, as well as high levels of nitrogen and phosphorus. If a septic system is well-maintained and working properly, it will remove most of these pollutants. Insufficiently treated sewage from septic systems can cause groundwater contamination, which can spread disease in humans and animals.

Improperly treated sewage also poses the risk of contaminating nearby surface waters, significantly increasing the chance of swimmers contracting a variety of infectious diseases, from eye and ear infections to acute gastrointestinal illness and hepatitis.

Service provider coming? Here's what you need to know.

When you call a septic service provider, he or she will inspect for leaks and examine the scum and sludge layers in your septic tank.

Your septic tank includes a T-shaped outlet which prevents sludge and scum from leaving the tank and traveling to the drainfield area. If the bottom of the scum layer is within six inches of the bottom of the outlet, or if the top of the sludge layer is within 12 inches of the outlet, your tank will need to be pumped. Remember to note the sludge and scum levels determined by the septic professional in your operation and maintenance records, as this will help determine how often pumping is necessary.

The service provider should note any repairs completed and the tank condition in your system's service report. If additional repairs are recommended, be sure to hire someone to make them as soon as possible.

The National Onsite Wastewater Recycling Association (NOWRA) website has a septic locator that makes it easy to service professionals in your area. Visit **www.septiclocator.com** and enter your ZIP code to get started!

Beware of septic tank additives!

Some makers of septic tank additives claim their products break down septic tank sludge in order to eliminate the need for pumping. But the effectiveness of additives has not been determined; in fact, many studies show that additives have no significant effects on a tank's bacterial populations.

Septic tanks already contain the microbes they need for the effective breakdown of household wastewater pollutants. Periodic pumping is the only true way to ensure that septic systems work properly and provide many years of service.

Protects the Environment

More than four billion gallons of wastewater is dispersed below the ground's surface every day. That's a lot of water! Groundwater contaminated by poorly or untreated household wastewater doesn't just pose dangers to drinking water—it poses dangers to the environment. Malfunctioning septic systems release bacteria, viruses, and chemicals toxic to local waterways. When these pollutants are released into the ground, they eventually enter streams, rivers, lakes, and more, harming local ecosystems by killing native plants, fish, and shellfish.

Maintaining Your Septic System:

The Basics

Septic system maintenance isn't complicated, and it doesn't need to be expensive. Upkeep comes down to four important elements:

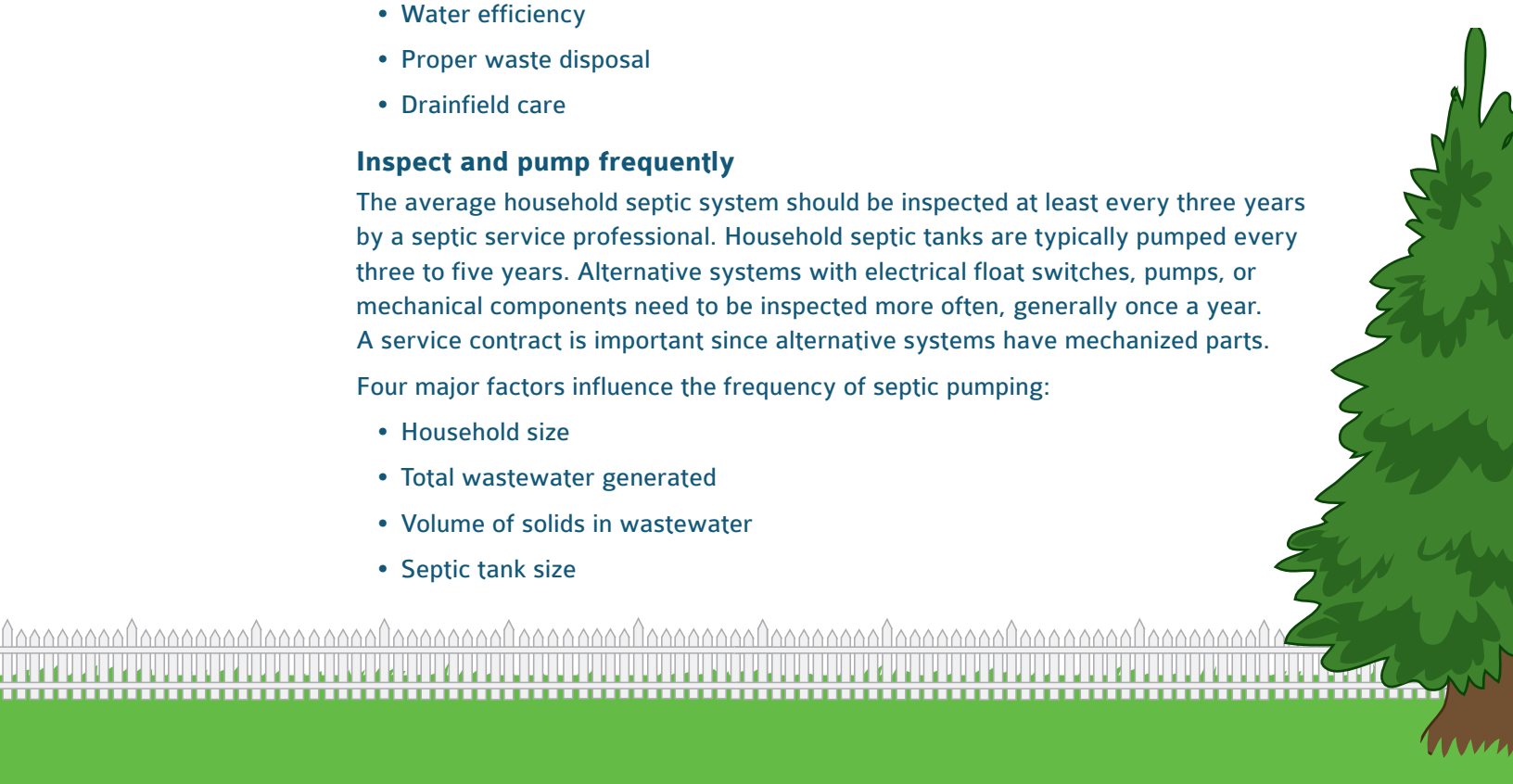
- Inspection and pumping
- Water efficiency
- Proper waste disposal
- Drainfield care

Inspect and pump frequently

The average household septic system should be inspected at least every three years by a septic service professional. Household septic tanks are typically pumped every three to five years. Alternative systems with electrical float switches, pumps, or mechanical components need to be inspected more often, generally once a year. A service contract is important since alternative systems have mechanized parts.

Four major factors influence the frequency of septic pumping:

- Household size
- Total wastewater generated
- Volume of solids in wastewater
- Septic tank size



Use water efficiently

Did you know that average indoor water use in a typical single-family home is nearly 70 gallons per individual, per day? And just a single leaky toilet can waste as much as 200 gallons of water per day?

All of the water a household sends down its pipes winds up in its septic system. This means that the more water a household conserves, the less water enters the septic system. Efficient water use can not only improve the operation of a septic system, but it can reduce the risk of failure as well. Learn more about simple ways to save water and water-efficient products by visiting EPA's WaterSense Program at **www.epa.gov/watersense**.

- **High-efficiency toilets:** Toilet use accounts for 25 to 30 percent of household water use. 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. Replacing existing toilets with high-efficiency models is an easy way to quickly reduce the amount of household water entering your septic system.
- **Faucet aerators and high-efficiency showerheads:** Faucet aerators help reduce water use as well as the volume of water entering your septic system. High-efficiency showerheads or shower flow restrictors also reduce water use.
- **Washing machines:** Washing small loads of laundry on your washing machine's large-load cycle wastes water and energy. By selecting the proper load size, you'll reduce water waste. If you're unable to select a load size, run only full loads of laundry.

  Another tip? Try to spread water use via washing machine throughout the week. Doing all household laundry in one day might seem like a time-saver, but it can be harmful to your septic system, as it doesn't allow your septic tank time to adequately treat waste and could potentially flood your drainfield.

  Consider purchasing an ENERGY STAR® clothes washer, which uses 35 percent less energy and a whopping 50 percent less water than a standard model. Learn more about ENERGY STAR appliances by visiting **www.energystar.gov**.

Small leaks can lead to big problems!

When it comes to water fixtures, a couple of quick fixes can save you serious problems down the road!

Check to see if your toilet's reservoir is leaking into your toilet bowl by adding five drops of liquid food coloring to the toilet reservoir before bed. If the dye is in the toilet bowl the next morning, the reservoir is leaking and repairs are needed.

Think a leaky faucet is no big deal? Think again. A small drip from a faucet adds gallons of unnecessary water to your septic 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). Just one cup of leaky faucet water every 10 minutes equals 36 wasted gallons of water a day—and they all end up in your septic system.

New faucets and toilet reservoirs are easily accessible and inexpensive. Choose to make a small investment for a big difference in your septic system.

- **Proper waste disposal:** Whether you flush it down the toilet, grind it in the garbage disposal, or pour it down the sink, shower, or bath, everything that goes down your drains ends up in your septic system. And what goes down the drain can have a major impact on how well your septic system works.

Toilets Aren't Trash Cans!

Your septic system is not a trash can. An easy rule of thumb? Don't flush anything besides human waste and toilet paper.

Never flush:

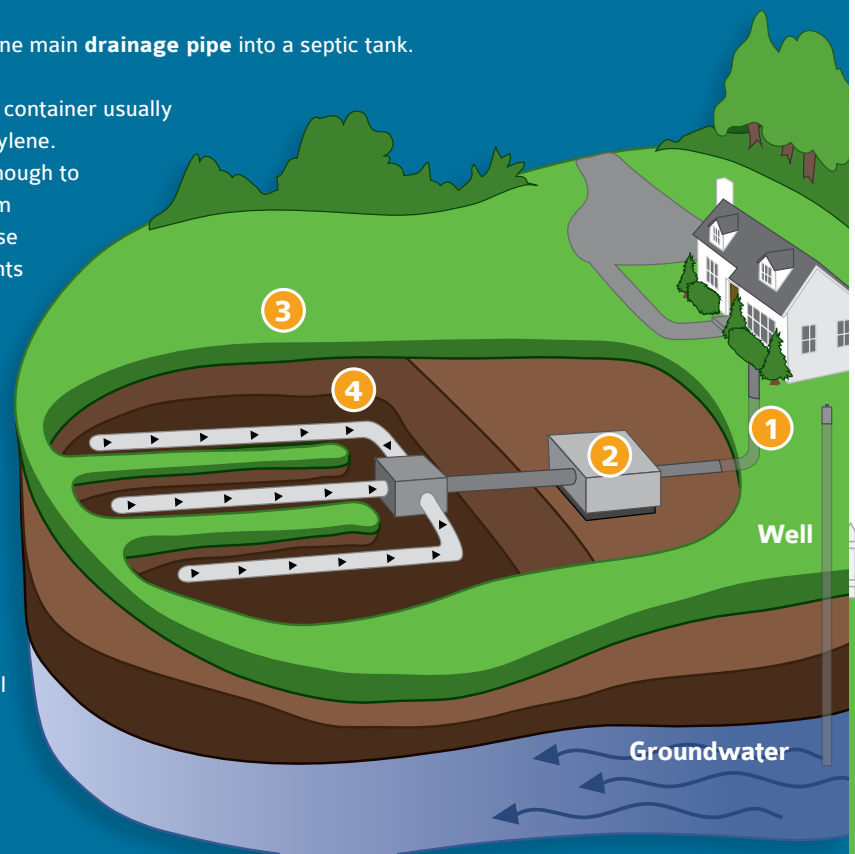
- Feminine hygiene products
- Condoms
- Dental floss
- Diapers
- Cigarette butts
- Coffee grounds
- Cat litter
- Household chemicals like gasoline, oil, pesticides, antifreeze, and paint
- Pharmaceuticals

For a complete list, visit **water.epa.gov/septicsmart**.

How does a septic system work?

This is a simplified overview of how a septic system works.

1. All water runs out of your house from one main **drainage pipe** into a septic tank.
2. The **septic tank** is a buried, water-tight container usually made of concrete, fiberglass or polyethylene. Its job is to hold the wastewater long enough to allow solids to settle down to the bottom (forming sludge), while the oil and grease floats to the top (as scum). Compartments and a T-shaped outlet prevent the sludge and scum from leaving the tank and traveling into the drainfield area.
3. The liquid wastewater then exits the tank into the **drainfield**. If the drainfield is overloaded with too much liquid, it will flood, causing sewage to flow to the ground surface or create backups in toilets and sinks.
4. Finally, the wastewater percolates into the **soil**, naturally removing harmful bacteria, viruses, and nutrients.



Own an RV, boat or mobile home?

If you spend any time in a recreational vehicle (RV) or boat, you probably know of the problem of odors from sewage holding tanks. Learn more about proper and safe wastewater disposal—download EPA's factsheet at **www.epa.gov/region9/water/groundwater/uic-pdfs/rv-wastewater.pdf** or call The National Small Flows Clearinghouse's Septic System Care hotline toll-free at 1-800-624-8301.

Take care at the drain

Your septic system contains a collection of living organisms that digest and treat household waste. Pouring toxins down your drain can kill these organisms and harm your septic system. Whether you're at the kitchen sink, bathtub, or utility sink:

- Avoid chemical drain openers for a clogged drain. Instead, use boiling water or a drain snake.
- Never pour cooking oil or grease down the drain!
- Never pour oil-based paints, solvents, or large volumes of toxic cleaners down the drain. Even latex paint waste should be minimized.
- Eliminate or limit the use of a garbage disposal, which will significantly reduce the amount of fats, grease, and solids that enter your septic tank and ultimately clog its drainfield.

Maintain your drainfield

Your drainfield—a component of your septic system that removes contaminants from the liquid that emerges from your septic tank—is an important part of your septic system. Here are a few things you should do to maintain it:

- Never park or drive on your drainfield.
- Plant trees the appropriate distance from your drainfield to keep roots from growing into your septic system. A septic service professional can advise you of the proper distance, depending on your septic tank and landscape.
- Keep roof drains, sump pumps, and other rainwater drainage systems away from your drainfield area, as excess water slows down or stops the wastewater treatment process.

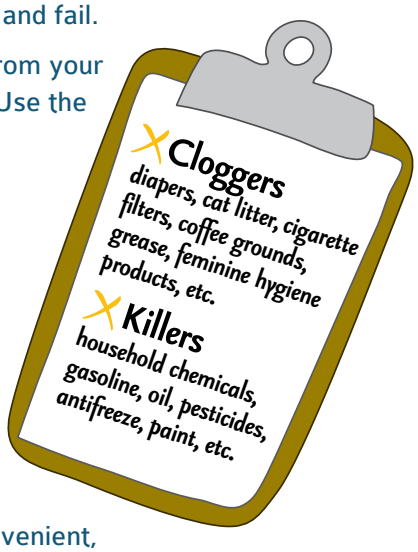
Failure Causes

Pouring household and home improvement chemicals down your drains, flushing garbage down toilets, excessive water use, and failure to provide proper maintenance aren't the only culprits for septic system failure. Take note of these additional causes of septic failure:

Hot tubs

Hot tubs may be a great way to relax, but when it comes to emptying them, your septic system should avoided. Emptying a hot tub into your septic system stirs the solids in the tank, pushing them into the drainfield, causing it to clog and fail.

Drain cooled hot tub water onto turf or landscaped areas far away from your septic tank and drainfield, and in accordance with local regulations. Use the same caution when draining swimming pools.



Water purification and softening systems

Some freshwater purification systems, including water softeners, unnecessarily pump water into septic systems. Such systems can send hundreds of gallons of water to septic tanks, causing agitation of solids and excess flow to drainfields. When researching water purification and softening systems, check with a licensed plumbing professional about alternative routing for such treatment systems.

Garbage disposals

Consider eliminating or limit the use of garbage disposals. While convenient, frequent use of garbage disposals significantly increases the accumulation of sludge and scum in septic tanks, resulting in the need for more frequent pumping.

Improper design or installation

The proper design and installation of a septic system is essential for it to correctly function. A home's groundwater table, soil composition, and a properly leveled drainfield are just a few factors to ensure a well-functioning septic system. Be sure to do your research when hiring septic professionals.

Failure symptoms: Mind the signs!

A foul odor isn't always the first sign of a malfunctioning septic system. Call a septic professional if you notice any of the following:

- Wastewater backing up into household drains.
- Bright green, spongy grass on the drainfield, even during dry weather.
- Pooling water or muddy soil around your septic system or in your basement.
- A strong odor around the septic tank and drainfield.

Mind the signs of a failing system. One call to a septic professional could save you thousands of dollars!

U.S. Environmental Protection Agency

For more information on how you can be SepticSmart, please visit:

www.epa.gov/septicsmart

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