

6 Septic Tank Pumping and Septage Disposal

6.1 Introduction

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A septic system requires periodic maintenance that includes pumping out the accumulated scum, sludge, and wastewater from the septic tank (cumulatively called septage). Septage generates offensive odors and presents public health hazards. To prevent nuisance conditions and public health hazards, septage must be collected (pumped), transported, stored, and disposed of according to the following rules:

- Rules Governing the Cleaning of Septic Tanks (IDAPA 58.01.15) (section 8.2)
- Wastewater Rules (IDAPA 58.01.16)
- Standards for the Use or Disposal of Sewage Sludge (40 CFR 503)

Septic tank pumpers have the important task of not only helping the homeowner maintain the system by pumping the septic tank but protecting the property owner and public from the various health hazards associated with septage. To protect and help the property owner, a pumper needs to understand how the septic system operates and proper procedures for pumping the septic tank and septage disposal.

6.2 Septage and Public Health

Pathogens that pass in urine, feces, or bodily fluids can be found in sewage. Septage may contain any number of these pathogens. The following list provides an example of pathogens present in septage including, but not limited to, the following:

- Bacterial organisms (*Salmonella*, *Shigella*, and *Clostridium*) and typhoid (*Salmonella typhi*)
- Parasites (pinworm, roundworm, and hookworm), especially in the scum layer
- Organisms that cause amoebic dysentery, polio, and hepatitis

Proper management of septage upon its removal from the septic tank through its ultimate disposal or beneficial reuse is critical in ensuring the protection of public health from the pathogens present in septage.

Septage Classifications

While all wastewater that enters a septic tank is septage, the source of the wastewater before it enters the septic tank determines the classification of the septage. All septage that comes from domestic or residential activities is classified as domestic septage. Examples of wastewater sources that result in domestic septage include, but are not limited to, single and multifamily residential housing, restrooms (including shower facilities), and break rooms. Domestic septage includes the contents removed from septic tanks, portable toilets, privy vaults, wastewater holding tanks, type III marine sanitation devices, RV holding tanks, very small wastewater

treatment plants, or semipublic facilities (e.g., schools, motels, mobile home parks, campgrounds, and small commercial endeavors) that receive wastewater from domestic sources.

Industrial or commercial process wastewater is classified as nondomestic septage. Nondomestic septage includes the contents removed from septic tanks or wastewater holding tanks that receive wastewater from industrial or commercial sources. Nondomestic septage also includes, but is not limited to, the contents removed from grease traps or sand-oil separators. If industrial or commercial wastewater is mixed in any ratio with domestic wastewater, the entire mixture is classified as industrial or commercial wastewater. If nondomestic septage is mixed in any ratio with domestic septage, the entire mixture is classified as nondomestic septage.

Septage classification can have an impact on the allowable disposal or beneficial reuse of the septage. Septic tank pumpers need to be aware of the septage classifications of the materials they pump and haul so proper septage disposal can be achieved. Additionally, it is recommended that facilities producing domestic and nondomestic wastewater isolate the wastewater plumbing and discharge these wastewater sources to separate septic tanks. This allows the domestic and nondomestic septage to be segregated so that the disposal and beneficial reuse options are maximized.

6.3 Septic System Components

The most common septic system consists of a septic tank and drainfield. Septic tanks are commonly constructed of concrete, polyethylene, polypropylene, or fiberglass (see section 5.2 for approved products). Drainfields are installed at varying depths under the ground, either in the form of trenches (up to 6 feet wide and 100 feet long) or an absorption bed (greater than 6 feet wide and up to 100 feet long). Drainfields are also filled with gravel containing a perforated plastic pipe or gravelless system components (see section 5.7 for approved products). Figure 6-1 shows the components of a standard septic system.

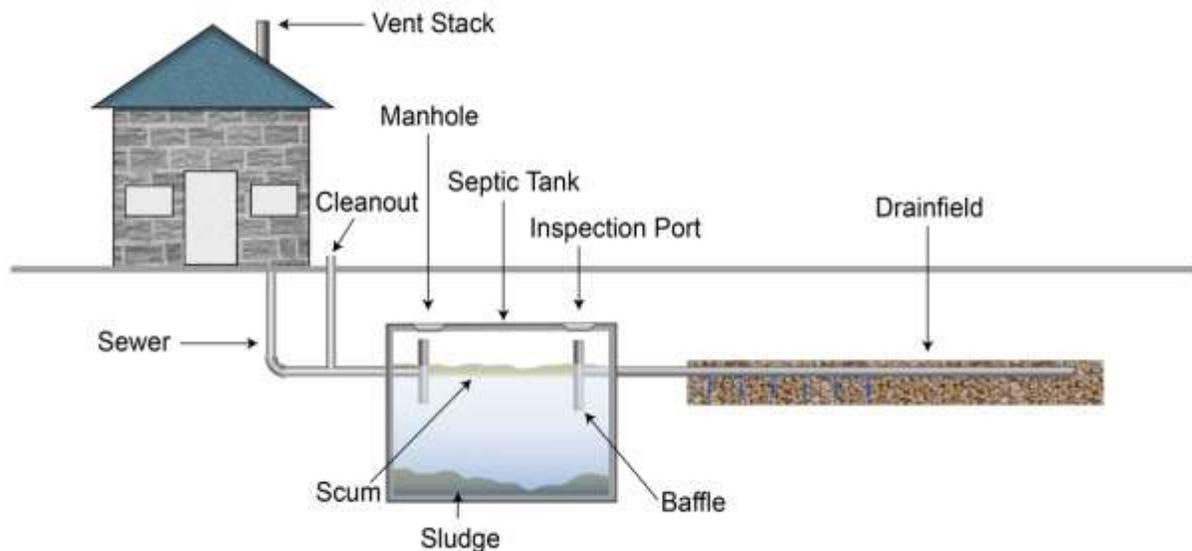


Figure 6-1. Components of a standard septic system.

Several alternative system designs may have additional tanks referred to as dosing chambers, recirculating chambers, or ETPS. These types of tanks typically contain less accumulation of scum and sludge but are recommended to be pumped to remove these accumulations whenever the septic tank is pumped. These types of tanks also contain mechanical components that must be considered before pumping the tank's contents. It is highly recommended that the component manufacturer's recommendations be followed when these alternative tanks are pumped. In the case of ETPS, the property owner's O&M entity should be contacted for approval before pumping the unit's tank.

6.4 Septic System Mechanics

Wastewater from a home or business enters the septic tank where the velocity quickly slows. Because of the slowing, material in the wastewater that is heavier than water, such as feces and garbage, settles to the bottom as sludge. Material in the wastewater that is lighter than water, such as grease and plastics, float to the top as scum. The liquid in the center of the tank, now with the sludge and scum settled out, is called effluent and is the liquid that flows from the septic tank to the drainfield. Upon being dispersed to the drainfield, the effluent is treated by the soil and organisms in the soil. For a septic tank to function properly (scum and sludge settling and retention), the inlet and outlet baffles within the tank must be intact and in good condition. Proper baffle design is described in IDAPA 58.01.03.007.10 and 58.01.03.007.11 (section 8.1). Anytime a septic tank is pumped or a drainfield is repaired, the inlet and outlet side of the septic tank should be uncovered, and the baffles should be inspected to ensure the septic tank is in good working order.

The septic tank will function satisfactorily until the sludge fills over 40% of the volume of the tank (as measured from the bottom of the septic tank to the invert of the tank outlet), or the scum reaches the top of the inlet or outlet baffle in the tank.

Before the tank reaches these levels, it should be pumped by a permitted pumper. If the tank is not pumped, it will be unable to perform its wastewater separation function, which will allow the solids and greases to be carried out into the drainfield. If solids and greases reach the drainfield, they will fill and clog the soil pores causing the drainfield to fail resulting in sewage backing up into the home or business, the tank to overflow, or effluent to reach the ground surface around the drainfield. Under regular use (two people in the first bedroom and one person in every other bedroom), it is recommended that the septic tank be inspected every 3–5 years and pumped as needed.

6.5 Checking the Level of Scum and Sludge in a Septic Tank

The scum and sludge levels in the septic tank should be checked at least once every 3 years under regular use. If the septic system receives more than regular use, the scum and sludge levels should be checked annually. A property owner, permitted septic tank pumper, or permitted septic system installer can check the scum and sludge levels in the septic tank.

The following outlines the procedure for locating a septic tank:

1. Review the final as-built drawing located on the final inspection form for the property owner’s septic permit. If the property owner does not have a plot plan of the tank location, often the health district will have its location on file.
2. If no drawings can be found, a guess as to where the tank is located can be made by finding the 3- or 4-inch vent stack on the roof, or a cleanout near the foundation. The tank is often located directly out from the stack or cleanout.
3. If the previous methods do not work, the sewer can also be located in the crawl space by noting the place where the sewer pipe exits under the building’s foundation.
4. With a steel rod, probe the ground to locate the tank. The tank, or the manhole cover on a riser, should be within 18 inches of the ground surface. Once located, excavate to the top of the tank and pull off the manhole cover.

The following outlines a procedure for checking the scum and sludge levels in the septic tank:

1. With a shovel, break through the scum layer, making a hole about 1 foot in diameter.
2. Wrap a strip of terry cloth toweling spirally around a pole and lower the pole into the tank. If the pole is fitted with a hinged flapper about 2 feet from its bottom, the flapper swings down, and the scum level can be checked.
3. Lower the pole into the septic tank liquid until the flapper is about 1 foot below the scum. Pull the pole towards you a little to get the flapper under the scum, then raise the pole until the scum begins to move up, indicating that the flapper has made contact with the scum. Mark the pole at the top of the scum so that the depth of the scum can be measured from the pole after it is removed.
4. Continue to lower the pole into the septic tank until it meets the bottom. Tap the bottom of the tank two or three times with a sharp rap, which permits the sludge to enter into the coarse weave of the terry cloth. Slowly remove the pole. The depth of the sludge will then be seen in the terry cloth.
5. Alternatively, manufactured products are available for obtaining a representative profile of the septic tank sludge, liquid, and scum depths in place of the tool described above. These manufactured products are recommended for professionals who pump septic tanks or install septic systems because the tool can be cleaned and maintained for repeated use.

Calculate the depth of the sludge as a percent of the liquid depth (measured from the bottom of the tank to the top of the liquid/bottom of the scum layer). Equation 6-1 can be used to determine if a septic tank needs pumping.

$$\text{Percent sludge depth} = \frac{\text{Depth of sludge, in inches}}{\text{Liquid depth of tank, in inches}} \times 100$$

Equation 6-1. Percent sludge depth.

When sludge is greater than 40% of the liquid volume, or the scum layer is at or above the top of the inlet or outlet baffle, the tank should be pumped.

Figure 6-2 illustrates methods used to check scum and sludge depths.

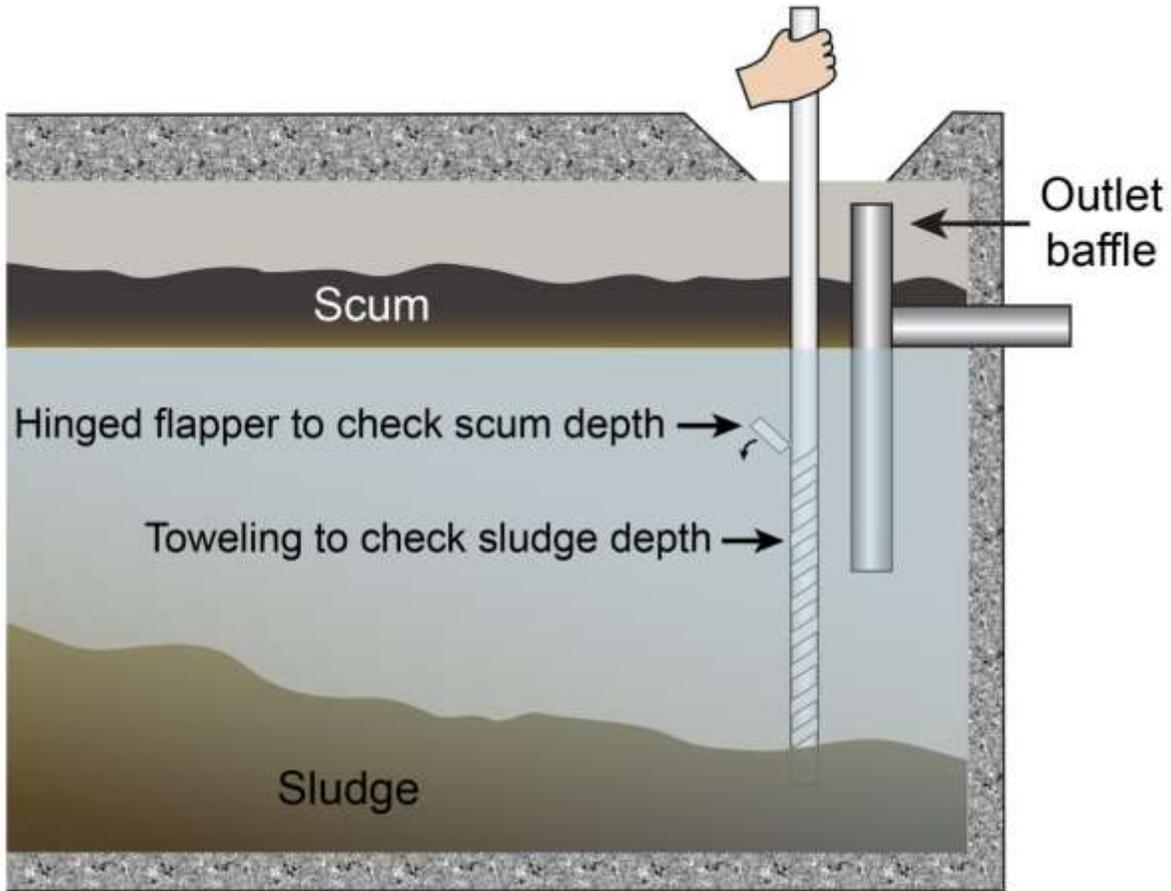


Figure 6-2. Methods used to check scum and sludge depths.

6.6 Septage Pumping

All persons, firms, or corporations operating any tank truck, device, or equipment used or intended to be used for the purpose of pumping and transporting septage must comply with the “Rules Governing the Cleaning of Septic Tanks” (IDAPA 58.01.015). The following subsections provide guidance and recommendations on septage pumping and transporting equipment requirements.

6.6.1 Equipment for Pumping and Transporting Septage

The major and most expensive piece of equipment needed to pump septage is the pumper’s truck. Capacity of a truck used to pump septic tanks, RV dump stations, or wastewater holding tanks should be at least 1,000 gallons. The capacity of a truck used to pump portable toilets or vault privies should be at least 500 gallons. The truck should also have the following:

- An access port for the periodic inspection, maintenance, and cleaning of its interior. The truck should also have a gauge to indicate the volume of liquid it contains.
- The tank should have a gravity drainage valve that can be safely locked during transportation and storage. The discharge valve used to dispose of the septage should be

at least 2.5 inches in diameter and equipped with a cam-lock quick couple or screw cap. The valve should be located so that the discharge stream is not blocked in any way, unless it is necessary for disposal.

- The pumping equipment on the truck should be sized to provide at least 15 feet of suction lift and should be able to reverse flow.
- There should be a water trap between the tank and pump to prevent liquid from entering the pump in case the pump pulls a vacuum on the tank.
- Several lengths of hoses should be available that can stretch from the pumping vehicle to a client's tank. The hoses from the tank and pump should be at least 3 inches in diameter.

All equipment used to pump or transport septage must be watertight and constructed so that spilling or leaking of septage during pumping, transportation, or unloading is prevented (IDAPA 58.01.15.003.01). Additionally, all equipment used to pump or transport septage must be constructed to allow every portion of the interior or exterior of the equipment to be cleaned and maintained in a clean condition when not in use (IDAPA 58.01.15.003.02). All permitted vehicles used to pump or transport septage must also have the permit number for each vehicle displayed at all times on the door of the vehicle in a manner that is easily legible (IDAPA 58.01.15.004.03). Easily legible is considered to be letters at least 3 inches high on both sides of the truck. It is also recommended that the name of the firm, address, business phone number, and tank capacity be displayed on the side of the truck.

Septage pumpers may also want to consider including several other pieces of equipment with their pumping and transportation vehicles. These recommended pieces of equipment will help pumpers complete the job and provide their clients with information regarding the condition of their septic tank. Other recommended equipment includes the following:

- Flashlight
- Steel lid probes
- Manhole sealer
- Bucket
- 50-foot garden hose
- Long-handled shovel
- Pry bar or pick
- Container of Quick Lime
- Pole, hoe, or rake for scum mixing
- A pole or equipment that allows the depth of scum and sludge to be determined
- Extension mirror used to inspect the tank's inlet and outlet baffles
- A spray bar or splash plate for use in domestic septage land application (if contracted with an approved site and approved by the health district)

6.6.2 Permit Requirements

A permit is required throughout Idaho for pumping, transportation, and disposal of septage (IDAPA 58.01.15.003 and 58.01.15.004). A permit can be obtained from any health district

within Idaho and allows the permittee to pump, transport, and dispose of septage throughout the state. Permits must be renewed annually and applications for renewal must be submitted to the health district on or before March 1 of each year (IDAPA 58.01.15.004). An application must be submitted to obtain a permit from a health district for pumping, transportation, and disposal of septage (IDAPA 58.01.15.004.01). Permit applications must include the following information:

- Number of tank trucks operated
- Vehicle license number of each tank truck
- Name and address of the owner and/or operator of the tank trucks
- Name and address of the business
- Method of septage disposal to be used in all areas of the operation
- Location of all disposal sites used by the applicant (location information must be accompanied by signed approval from the disposal site operator indicating that all the trucks included in the application can dispose of septage at that location.)
- Payment of the permitting fee as set by each health district

Upon submission of a permit application to a health district, an EHS will inspect the tank trucks and associated equipment before issuing the permit. A permit will not be issued until all the requirements of IDAPA 58.01.15 are met by the applicant.

6.6.3 Septic Tank Pumping

Once a septic tank has been located, and the manhole cover exposed and removed, the depth of scum and sludge should be determined using the following procedure:

1. Draw down the liquid level 6 inches to 1 foot.
2. Break up the scum using a pole, rake, or hoe.
3. Mix the scum with the tank's contents.
4. Continue pumping the tank until most of the contents are removed. If needed, force septage back into the tank to mix up and remove the sludge on the bottom of the tank.
5. After the tank's contents have been mixed, do not let the septage come back up to the outlet because sludge may run into the drainfield.
6. Leave a few inches of sludge in the bottom of the tank as seed to restart bacterial action as the tank refills.
7. Do not disinfect the interior of the tank.

When pumping is completed, thoroughly inspect the tank and note the following on a pumping receipt for the client:

- Date.
- Volume of septage removed from each tank.
- Depth of scum and sludge in each tank.
- Condition of the inlet and outlet baffle in each tank.
- Condition of the walls and floor of the tank for the presence of cracks, corrosion, or damage.

- Is water running back into the tank from the drainfield? (Possible sign of high ground water in the drainfield or back pressure from a failing drainfield)
- Is water running in through the sides of the tank? (Sign of a leaking tank in high ground water)
- Does the sewer line from the house appear to be free-flowing? (Turn a fixture on inside the structure to ensure that there is no obstruction.)

NEVER enter a tank as the methane gas produced by the septage can kill quickly! Entry into any tank requires a confined space entry permit through the Occupational Safety and Health Administration and proper personal protective equipment.

If a manhole cover of a tank is found to be more than 18 inches belowground (as may be the case with older tanks or tanks serving basements), the property owner should be advised to add a concrete or plastic standpipe/riser that would place the manhole cover within 18 inches of the ground surface. The standpipe/riser is recommended for both the inlet and outlet sides of a tank.

After the manhole cover is replaced, replace soil and sod if the manhole is belowground. Put a little Quick Lime on any places where septage may have spilled.

6.7 Septage Storage

Some septage pumpers, transporters, composters, or land application site operators may find it necessary for their operation to store septage before disposal or beneficial reuse. If a pumper, transporter, composter, or land application site operator needs to store septage, the facility they construct to accomplish this must meet the requirements of “Septage Transfer Stations” (IDAPA 58.01.16.519). Any proposed septage transfer station must also meet IDAPA 58.01.16 requirements, and the associated documents must be submitted to the DEQ regional office along with their septage transfer station plans:

- Review of plans for municipal wastewater treatment or disposal (IDAPA 58.01.16.400).
- Demonstration of technical, financial, and managerial capacity (IDAPA 58.01.16.409).
- Facility plans (IDAPA 58.01.16.410).
- Preliminary engineering reports (IDAPA 58.01.16.411).
- Submission of plans and support documents (IDAPA 58.01.16.420).
- O&M manuals (IDAPA 58.01.16.425).
- If a screening facility is also to be constructed in association with a septage transfer station, the designs for that facility must be included with the transfer station plans but is exempt from the requirements of “Screening and Grit Removal” (IDAPA 58.01.16.450).

The act of screening septage is defined as treatment (IDAPA 58.01.16.010.85). Based on this designation of screening as treatment, any septage transfer station that employs screening must have a properly licensed wastewater operator in charge of the wastewater system and screening facility (IDAPA 58.01.16.203). DEQ exempts all stand-alone septage transfer stations and associated septage screening facilities from the licensed operator requirement as long as the septage transfer station meets the following:

- Located at a permitted pumper's place of business, or
- Located at a permitted domestic septage land application site or approved composting site.
- Is owned, operated, and maintained by the permitted pumper, land application site, or composting site operator.
- No additional wastewater treatment components or processes are included in the septage transfer station design.
- Septage transfer stations located at, or associated with, a wastewater treatment plant are not subject to these exemptions.

6.8 Septage Disposal

Septage may only be disposed of in conformance with the methods allowed by IDAPA 58.01.15.003.03. Those methods include the following:

1. Discharging to a public sewer
2. Discharging to a sewage treatment plant
3. Burying under earth in a location and by a method approved by DEQ
4. Drying in a location and by a method approved by DEQ

The first two methods of disposal require approval from the owner or superintendent of a wastewater treatment plant or the owner/operator of the public sewer. It is important for a pumper to note that discharging to a public sewer without the proper approvals puts the pumper in violation of the National Pollutant Discharge Elimination System pretreatment requirements and associated federal codes. Disposal at a wastewater treatment plant should be used whenever practical.

Disposal methods 3 and 4 are associated with disposal or land application of domestic septage. Nondomestic septage may not be approved for one-time disposal or beneficial reuse. Approval for one-time disposal of domestic septage must be obtained through the health district that the one-time disposal site is located within. Written approval from the property owner must be supplied to the health district along with the request for one-time domestic septage disposal. Pumpers seeking approval of continuous domestic septage land application sites need to contact the DEQ regional offices and follow DEQ's guidance for land application of domestic septage.

One-time disposal accomplished through burial shall ensure the following:

- Complete burial is accomplished within 6 hours of domestic septage disposal.
- The disposal depth meets the separation distance requirements of IDAPA 58.01.03.008.02.c for ground water and IDAPA 58.01.03.008.02.d for surface water in soil design group C soils.

One-time disposal accomplished through drying shall ensure the following:

- The domestic septage is pH adjusted to a pH of at least 12 for a full 30 minutes before domestic septage disposal.

- The disposal depth meets the separation distance requirements of IDAPA 58.01.03.008.02.c for ground water and IDAPA 58.01.03.008.02.d for surface water in soil design group C soils.