Septic System Troubleshooting Guide

©1988 Russ Lanoie, NH licensed septic designer & installer
RR1 Box 176, Conway, NH 03818

The Guide consists of three parts: **Flow Chart**, **Notes** and **Glossary**.

Use the **Flow Chart** to inspect or troubleshoot a system. Choose from one of the following four main headings:

- **Routine Inspection:** use this path for checking out the septic system for property transfer or for locating a "missing system"
- **Poor Flush:** indicates a problem with that toilet fixture only
- **Toilet and Drain Backup:** several of the plumbing fixtures have problems, which means that wastewater is not leaving the house properly, suggesting that the septic system may be in trouble, or ...
- **Odor or Water on Ground:** even though everything is O.K. inside, there is a foul smell and/or water coming out of the ground in the suspected area of the septic system.

Follow down through the sequence of the chart, choosing from the options as you proceed. Where you are told to "see 1, see 5, etc.", refer to **Notes** section for a more complete description of how to proceed.

The **Glossary** explains many of the terms used on this chart as well as other terms related to septic systems, their installation and their operation.

Good luck. Please call or E-mail with ideas to improve this guide or with stories of frustration or success.

603/447-5266 Fax: 447-3719
E-mail: septicinfo@frontrunnercorp.com

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TROUBLESHOOTING NOTES

1. ***Check lowest fixture or drain.*** If problem is septic blockage, water should back up through any drain which is below level of toilet when flushed. Check washing machine outlet, floor drain, bathtub, downstairs apartment, or remove cleanout plug carefully (to avoid a flood). If not backup, problem is probably with toilet or other household plumbing only.

2. ***D-Box problems.*** If distribution box for side-hill trench system is out of level, one trench may be taking all water and "failing." Re-level pipes and block outlet to overload trench for several months. Roots may also be blocking one or more pipes. Remove roots and seal joints where roots enter if possible.

3. ***Pumps and floats.*** Exercise care handling pumps as they have 110- or 220-volt supply lines, which may not have GFIs. Some float systems (which turn pump and alarm on and off) may also contain full line voltage. Use insulating rubber gloves and follow procedures with a disinfecting wand wash for sanitation. Or call licensed plumber, if required by code.

4. ***Snake safety.*** Exercise care using snake in cleanouts or drains as some waterborne diseases can be transferred through contact. Use rubber gloves and surgical mask and follow with disinfecting wash. Stiff garden hose can sometimes be used in place of snake. Disinfect after use.

5. ***Failed field.*** Usually means soil clogged due to age, overuse, underdesign, lack of maintenance, or a combination of these. Requires field replacement or rest. (See "alternating fields" in Septic System Glossary.)

6. ***Failed drywell.*** Same reasons as (5) above. However, drywells can sometimes be excavated around and packed with crushed stone to create a new soil surface for absorption. Check codes.

7. ***Pipe problems.*** Settling, breaking, crushing, pulling apart, and backsloping are installation related. Freezing, plugging at joints, and root plugging (though also caused by poor installation) can occur later. Insulating, replacing, releveling, sealing joints, and properly backfilling will resolve most problems.

8. ***Find septic tank.*** If homeowner does not know exact location of septic system or have accurate plan to follow, start looking for septic tank outside of house where waste pipe exits basement wall. (Note pipe direction through wall.) If plumbing exits below slab, check side of house with roof vent, especially if most of plumbing is on that side of house. Look for spot on the ground where snow melts first, grass turns brown, or there is a slight depression or mound. Steel tanks will sometimes bounce slightly when jumped on, but be careful, steel lids rust out!

A thin steel rod with a tee handle makes a handy probe. Drive probe until achieving several "hits" at the same depth to indicate tank top. A metal detector can help. Even concrete tanks and cesspool covers generally have steel reinforcing within. Another trick is to insert a snake in house cleanout and push it until it stops. Gently sliding snake against inlet baffle can often send a shock that can be heard and/or felt at ground surface by second person. (Note that sometimes a snake can curl up within a septic tank or, particularly, in a cesspool, sometimes making this technique useless.)

If snake hits obstruction but cannot be felt at surface, remove it from cleanout and measure its penetration. Draw an arc the distance of snake penetration from the house and try again with the probe. Remember that the pipe from the house may not be heading straight towards the tank.

If all else fails, locate and uncover the waste pipe where it leaves the house and again every few feet until the tank is located. Or ask previous owner, neighbor, or septic pumper who may have serviced the system in the past.

Note: Devices are available that transmit a radio signal along a snake or from a tiny "mole." Signal is traced by a receiver wand as snake is pushed through waste pipe.

9. ***Determining the type of tank found.***

- ***Primary/secondary septic tank.*** Two or more tanks are used in some installations for better settling and detention of solids. First tank should have fresh waste entering directly from house. (Flush colored paper towel down toilet and watch it enter at inlet manhole.) Second tank should have a little floating grease and scum, with some settled sludge at bottom. Note that septic tank always has an outlet unless it is being used as a holding tank.
- ***Cesspool or drywell.*** Likely has no outlet and seldom has an inlet baffle. Liquid level could be low in a septic tank if tank is rusted out (steel tank) or if center seam leaks (concrete tank). If fresh waste is present, see Glossary, "cesspool." If no fresh waste is present, see Glossary, "drywell."
- ***One of a series of cesspools*** (see Glossary, "cesspool").
- ***Greasetrap.*** Found in restaurants, inns, markets, etc. (see Glossary).
- ***Pump tank*** (see Glossary). If water runs back into septic tank from the outlet pipe when the tank is pumped out, system has probably failed. See (5) or (6) above.

10. ***Inlet/Outlet problems.*** Plugging often occurs from scum buildup within baffles, roots entering through poorly sealed joints, tanks installed out-of-level or backwards, or pipes sticking into the tank too far and nearly hitting baffles, blocking waste. Correct as needed.

11. ***Locating field or drywell.*** Follow directions for finding septic tank (8), except start at septic tank outlet rather than at house. Snake will not hit a baffle within drywell as there is none. It may or may not hit side of D-Box but could pass through into one of outlet pipes.

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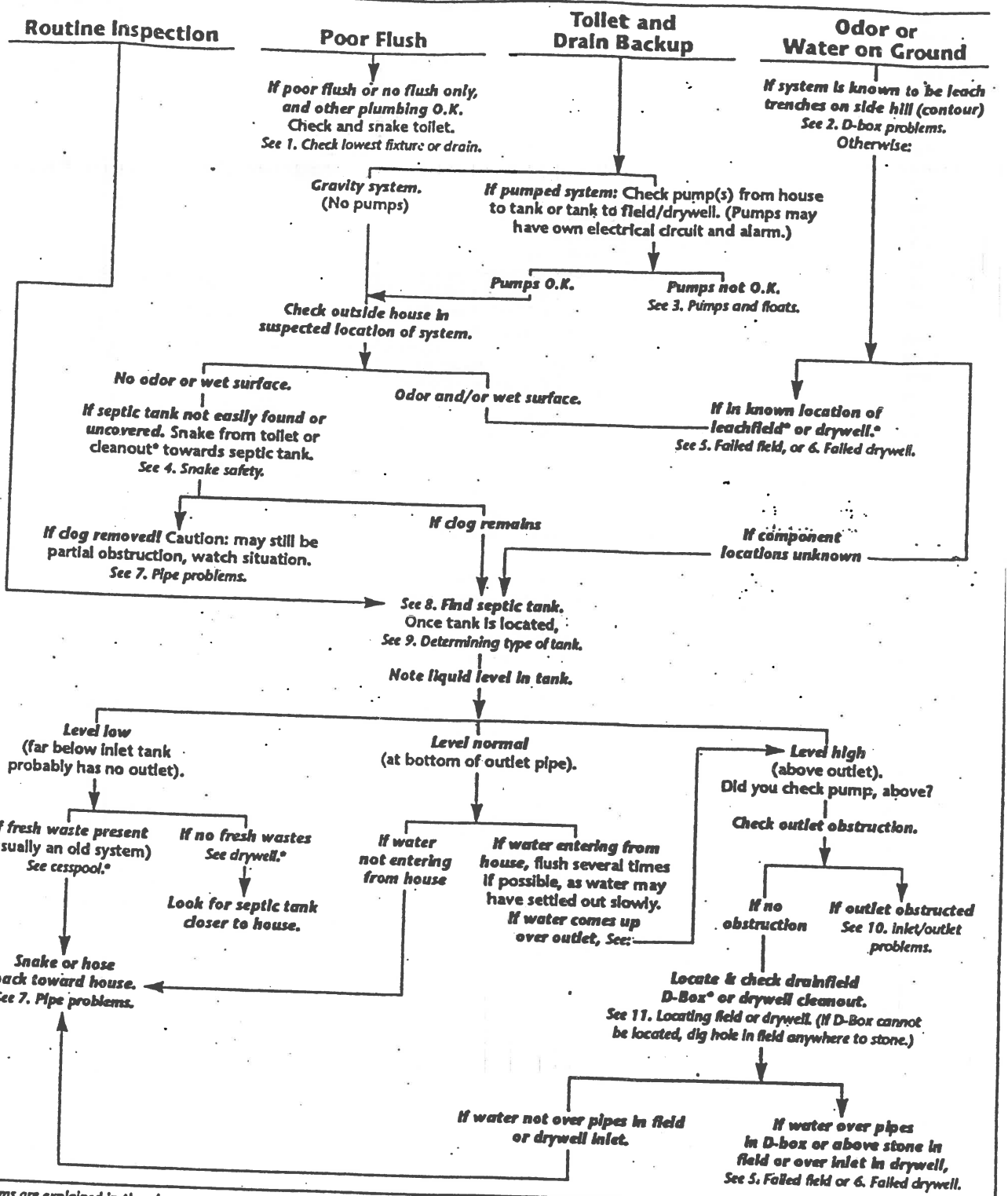

* Items are explained in the glossary, next page.
Numbered items are explained in accompanying notes.

device that provides audible and visual indication that the water level in a pump or holding tank is above what it is supposed to be.

Alternating leach field: One of two or more leach fields designed to be used while the other(s) rest. They are generally fed via a manually operated diverter valve located in the line from the septic tank.

Baffles: Pipe tees or partitions within a septic tank, which reduce turbulence at the inlet and prevent floating greases and scum from escaping into the leaching system at the outlet. (They are usually the first part of a steel tank to rust away, leaving the leach field or drywell unprotected from excessive solids overloading.)

Cesspool: The original type of sewerage system, often still in use in older homes. They were simply a single hole in the ground loosely blocked up with locally available materials — stone, brick, block, or railroad ties — and capped either with ties covered with a layer of old steel roofing or a cast-in-place concrete lid with a cleanout hole near the center. All and the liquid portion was absorbed into the ground. When the soil plugged, a new cesspool was added. Wiser installers placed an elbow, or better still, a tee in the outlet pipe from the first cesspool, creating a baffle to hold back the floating greases and scums (see *Baffles*).

In a sense, this created the first type of septic system, because the first cesspool in the line, sealed by its own demise, served as a septic tank and the subsequent tank provided a greater degree of settling and separation of soil-plugging solids and some absorption. (Owners often have the first tank pumped out to maintain system operation.)

Chambers or ameration chambers: Open-bottomed precast concrete or plastic structures, which are placed next to each other in an excavation to take the place of crushed stone in a leach field. Unlike leach fields, heavy-duty chambers can be driven over.

Cleanout: A removable plug in a "wye," or a "tee" in a sewer line, where a snake can be inserted to clear a blockage.

a small square concrete box within a leach field from which all pipes lead to disperse effluent within the field. Newer boxes should be marked at the surface to protect from vehicle traffic.

Drywell: Constructed identically to a cesspool and differs only in that the clarified effluent from a septic tank or the wastewater from a washing machine or other grey water may enter. Modern drywells are often precast perforated rings surrounded by crushed stone to increase the absorption area.

Drywells are not commonly installed today because of laws requiring the bottom of a leaching system to be 4 feet above the seasonal high-water table.

Effluent: The liquid that flows out of the septic tank after the tank has "taken out the big pieces."

Grease trap: An in-ground chamber similar to a septic tank, usually used at restaurants, markets, and inns to trap grease from the kitchen wastewater before it reaches the septic tank. Unusual to find in private homes.

Grey water: All liquid wastewater except for the toilet wastes (sink, shower, washer, etc.).

Leaching system: The part of a septic system that returns water to the ground for reabsorption. Could be a drywell, leach field, trenches, chambers, etc.

Leach bed: A leaching system which consists of a continuous layer of crushed stone about a foot deep, usually in a rectangular layout, with perforated pipes laid level throughout to disperse effluent as evenly as possible over the entire bed.

Leach field: Term often used to describe either a leach bed or leach trenches.

Leach trenches: Built essentially like beds, except that each pipe is in its own stone-filled level trench, usually 3 feet wide. Each trench can be at a different level than the other trenches. Well suited to sloping ground.

Mound (or raised) system: A leach bed built on a mound of fine to medium-grained sand to elevate it above the seasonal high water table and/or to accommodate a system on a hillside.

Percolation test: A shallow, hand-dug hole saturated with water, performed as a part of a septic design to determine the soil's permeability — the rate at which water is absorbed by the soil — which dictates the system size.

Pump station, pump tank: A watertight container, usually (but not always) separate from the septic tank, into which effluent flows by gravity and is then ejected by a submersible electric pump through a pressure line to the leaching system. Pump tanks often are hooked to an alarm to warn of pump failure.

Seasonal high water table: The highest elevation that groundwater reaches within the year (usually in the spring). Many states require the bottom of a leaching system to be at least 4 feet above this point.

Septic tank: A watertight chamber, which all household wastewater enters for settling and anaerobic digestion of greases and solids. Original tanks were made of asphalt-coated steel. Modern tanks are made of concrete, fiberglass, or plastic. All tanks should have a set of baffles, which are critical to their operation.

Most tanks have an inspection hatch at both the inlet and the outlet and some have a third hatch in between for pumping access. Locations of each of these should be recorded and/or marked. Steel tanks often have one round lid that covers the entire tank.

Septic tanks should be pumped every three years or so in normal operation. They should not be treated with any additives and should be protected from receiving any of the harmful chemicals used in many homes and commercial workshops. This includes disinfectants or bleaches, which can kill bacteria in the tank, and solvents, darkroom chemicals, or other materials that could pollute the water supply.

Septic design: Usually consists of a topographic survey, test pit, and perc test plus information about the water supply and subdivision and a filing fee to the state prepared by either a licensed designer or the owner.

Test pit: A hole dug to determine soil type, seasonal high water table, and depth to ledge. Some states require a test pit of specific depth (to determine that ledge is a minimum number of feet below bed bottom) while others require only a shallow pit to determine depth to hardpan soils.