You and Your Septic System
Part II - Septic System Maintenance, Troubleshooting and Upgrading

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Note: This is the second in a series of articles. The first article describing conventional septic systems appeared in the October, 2010 HALO newsletter. Future articles will discuss: (3) Advanced treatment wastewater systems, (4) Neighborhood cluster wastewater systems, (5) Municipal and State regulations governing on-site wastewater disposal, and (6) Certificates of On-Site Approval (COSA).

Septic System Maintenance:

The biggest benefit of a conventional septic system is that it has rather minimal maintenance requirements. However; many homeowners don't seem to realize that their septic system is a biologic treatment unit with a finite life span, and does require a certain level of on-going care and maintenance. Unlike the situation with homes served by public sewer where the responsibility for wastewater treatment lies with a centralized management authority, the homeowner with an on-site system must take a much more active role in the operation of the wastewater disposal system.

First and foremost, be sensible about what you send down the drain. Water is a great mechanism for transporting unwanted material away from your house, but only pure water can percolate through soil. So, in order to do its job, your septic system must break down wastewater solids into gaseous components or physically separate them from the wastewater stream. Grease is a problem. It doesn't decompose in a septic system and is good at clogging up pipes, so do yourself a favor and don't pour it down the drain. Garbage disposals chop up food very nicely so that it can disappear down the drain, but why? The more solids you send down the drain the sooner your septic system will fail. Why not take an extra minute and put food scraps in the trash….or better yet, compost them.

Second, have your septic tank pumped regularly. The primary purpose of your septic tank is to settle out as much as possible of the solid material in your wastewater and turn it into scum and/or sludge. This allows a vacuum pumper truck to pump the collected solid material out and dump it into a Municipal sewer for disposal. Some anaerobic decomposition of solids does take place in the septic tank, but particularly in Alaska's cold climate such decomposition is very slow and limited. A good rule of thumb is to have your tank pumped every two years. This is frequently enough to remove most of the solids than can be separated in the tank before they build up to the point that they flow on into the absorption field where they cannot be removed. Of course, no matter how well a tank does its job of separating out solids, there is always some remaining material with neutral buoyancy in the effluent. These suspended solids flow on into the soil absorption system, and eventually cause it to clog up and need to be replaced.

Troubleshooting Septic System Problems:

One of the less pleasant experiences in rural home ownership is when one suddenly discovers raw sewage backing up into a bathtub or through a floor drain. Ask any Hillside resident and you will probably be told a horror story about a septic system that acted up at the most inopportune time. Sewage backups can be caused by a number of problems, some of them much easier to remedy than others.

When this happens, the first step is to figure out just where the problem is. This can be easily done by removing the caps on the standpipes that are located just outside the foundation, at the septic tank and in the soil absorption system – and comparing the relative fluid levels in each. For example, if the fluid level is high in the septic tank, but not as high in the soil absorption system, this indicates that there is probably a simple plumbing problem in the pipe between the tank and the absorption system. This is frequently all there is to the problem, particularly in older septic systems where cast iron pipe was used. Over time the slow seepage of effluent causes a thick scale to build up in an iron pipe and eventually clog it completely. In some situations this type of blockage can be cleared with a snake – in others it may be necessary to arrange for a backhoe to dig up and replace the pipe with PVC.

Similarly, if the fluid level is high in the cleanout pipe next to your foundation, but not in the septic tank, the obstruction is somewhere between the two. If none of the exterior cleanout pipes have high fluid levels, then the obstruction must be somewhere inside the residence. In either case, call a plumber or a drain pipe cleaning company.

If, when you go outside to check the fluid levels in the standpipes, you discover a large, new depression in your yard where your septic tank used to be, you will immediately realize that that inexpensive steel septic tank has finally rusted out and collapsed. It will have to be replaced immediately, but a Municipal permit is required. Call a septic contractor and/or an engineer to draw up the permit application and do the work.

Finally, if the fluid levels in the soil absorption system standpipes, as well as in the septic tank standpipes, are all high you have a serious problem on your hands. The absorption field has failed, and is either clogged or inundated with groundwater; it will almost surely need to be upgraded in the near future. By reducing your water consumption you can probably get the system to limp along for a short while longer.

Upgrading a failing septic system:

The process of upgrading a septic system can be expensive, time consuming and very disruptive to your carefully manicured lawn. The first step is to arrange with an engineer to dig one or more test holes in order to assess the soil characteristics pertinent to the design of a replacement system. A typical test hole is dug with a backhoe down to a depth of 16 or 18 feet to allow visual classification of the soil strata and installation of a ***groundwater monitor tube***. Once the best soil stratum is identified, the engineer conducts a ***perc test*** to determine the rate that the soil can absorb water. Assuming the perc rate is acceptable and groundwater is not an insurmountable problem, the engineer then draws up a septic design, including a site plan illustrating the proposed location relative to constraints including wells, surface water, buildings and property lines, which is used to apply for a Municipal upgrade permit. After the permit is issued, the homeowner contracts with an excavator to install the system and arranges with the engineer to oversee the construction and submit required as-built documentation to the Municipality. In most cases the septic tank is replaced at the same time as the absorption field upgrade. The typical contractor cost for upgrading a conventional septic system is usually somewhere between $7000 and $15,000, depending on soil conditions and whether or not a new septic tank and/or lift station are also needed.

But, what if a site cannot be found on the lot with suitable soils for installing a conventional septic system upgrade? Unfortunately, this type of problem is arising with increasing frequency on the Hillside. This is because many of the sites with the best soils (i.e. sands and gravels) have already been developed, and

remaining sites may have impermeable silts and clays and/or shallow groundwater or bedrock. Since wastewater regulations require that all disposal systems be located a minimum of 100 feet from wells or any kind of surface water, these can severely limit the potentially useable portion of a lot. The separation distance problem is aggravated by the fact that street construction frequently results in the creation of seasonal streams in roadside ditches.

Until recently, the only option for upgrading the wastewater disposal system on lots that could not support a conventional septic system was to install a large (2000 – 4000 gallon) ***holding tank***. A holding tank collects and stores all the wastewater coming from a residence, and when it is full the contents must be pumped and trucked away and dumped into the Municipal sewer system. Although they do provide a functional solution, holding tanks are unpopular, both because of the on-going expense of pumping, and because they significantly decrease the value of a residence. Clearly other options are needed.

Part III in the next newsletter will address on-site ***Advanced Treatment Wastewater systems***.

Ted Moore is a local civil engineer who specializes in septic system design, construction and testing. Comments or questions on this article may be e-mailed to tgmoore@gci.net