

Maintenance of Low Pressure Distribution Septic Systems

The Water Quality Program Committee, Virginia Tech

Conventional septic systems will adequately treat and dispose of household wastewater under most conditions. However, when soil conditions are not suited to deal with the volume of effluent from a normal septic system, an alternative system, such as a *low pressure distribution* (LPD) system, may be the best choice.

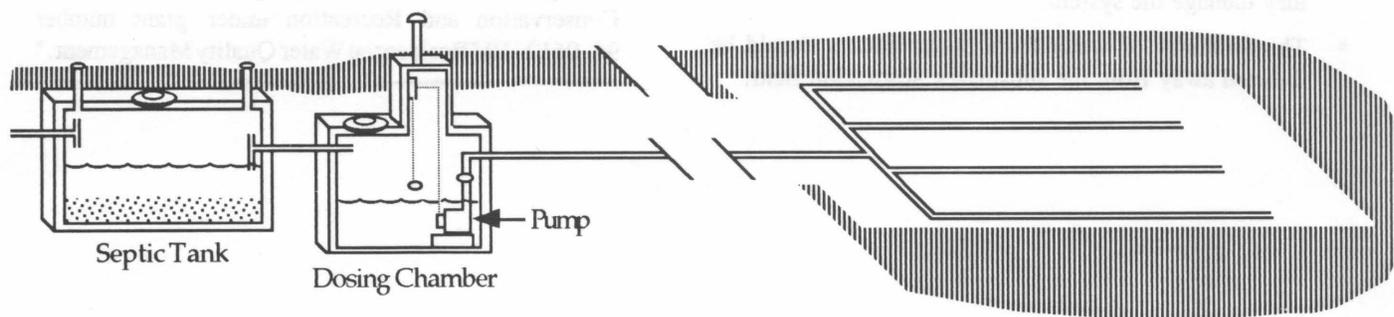
A conventional system relies upon gravity to deliver the wastewater, and this tends to do a poor job of evenly distributing the effluent throughout the drain field. With a gravity-fed system, every time water is used in the house, the soil receives another dose of effluent. During periods of high water use by the household, the soil in the drain field can become waterlogged which reduces its capacity to treat the effluent. If the soil is continuously oversaturated, it will become clogged and eventually cease to act as a filter for the wastewater.

A low pressure distribution system overcomes these two drawbacks of the normal gravity fed system. The LPD system differs from conventional systems by using a dosing chamber and a network of distribution pipes that are smaller in diameter than those used in normal gravity systems. The dosing chamber is an additional tank that receives effluent from the septic tank. The effluent is held in this chamber and then periodically pumped into the drain

field. This is known as a pressure dose system. The pressure dose system uniformly delivers the wastewater to the entire drain field, in contrast to the conventional gravity fed system that typically delivers the wastewater to less than 15 percent of the field. Because the soil receives the effluent evenly and over set intervals, it is much less likely to become saturated, and therefore works more effectively and has a longer life span.

An LPD system is equipped with a high-water alarm in the dosing chamber to alert the homeowner of any potential serious or sudden problems with the system. Homeowners should not wait until the alarm signals a problem, instead they should consistently follow recommended maintenance practices to ensure that the system continues to work well for as long as possible.

An LPD system is more complex than a conventional septic system and can often be more expensive to repair when something goes wrong. It is in the homeowner's best interest to properly maintain the septic system.



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Maintenance Recommendations

- If the system is not currently equipped with observation tubes, it is recommended that the homeowner have them installed. Observation tubes eliminate the need for the unearthing and removal of the access port in order to inspect the septic tank.
- Regular inspection of the dosing chamber by means of the observation tubes is encouraged. Any progressive increase in the depth of the water could be indicative of a problem.
- The septic tank and dosing chamber should be pumped out at least once every three to five years. Depending on the size of the septic tank and the number of people in the household, the interval between pumpings may need to be shorter. Tanks should be routinely inspected on a yearly basis to determine the rate of sludge accumulation. This will ensure that the system is pumped out well before it reaches a critical level.
- Maintain grass or another vegetative cover over the drain field to maximize water uptake and prevent erosion. Do not, however, plant trees or shrubs with extensive root systems on or near the drain field as they may clog drainage pipes.
- Avoid traffic and construction on the drain field site. This could compact the soil, reducing its absorptive capacity and possibly damaging the distribution pipes. Small riding lawn mowers can be used for cutting the grass over the drainfield. However, permanent fixtures, such as playground equipment, should not be installed over the area.
- Keep a diagram showing the location of the septic tank, dosing chamber, and absorption field in relation to the house.
- Take steps within the house to reduce water usage, and always avoid unnecessarily putting solids, such as food, plastics, and paper, into the wastewater system.
- Grease, oil, solvents, and toxic chemicals should never be poured or flushed down the drain. These materials may damage the system.
- The discharge of water from house gutters should be directed away from the subsurface absorption field.

Important Reasons for Proper Maintenance

- If the LPD system is improperly maintained, the filtering and renovating capacity of the drain field can be greatly diminished. The narrower pipes of a LPD system can become clogged more easily than those of a traditional system and parts of the distribution system may need to be replaced if they are damaged. If the soil becomes too congested, the site of the drain field may need to be relocated. These repairs can be costly and are worth avoiding through proper maintenance.
- Seepage from inadequate or failing septic systems can contaminate both ground and surface waters with undesirable pollutants, posing a danger to public health. Pathogens such as viruses or bacteria can enter drinking water supplies. Nitrogen, a common component of wastewater, can also enter water supplies causing a dangerous form of anemia in infants, commonly referred to as blue baby syndrome. High nitrogen levels in the drinking water have been linked to birth defects and cancer as well. For households that use unfiltered wellwater, septic system failure can be an especially significant problem. Malfunctioning septic systems are currently the leading cause of groundwater contamination in Virginia.
- Nutrients and organic matter found in wastewater, can enter open waterways through both surface runoff and groundwater contamination. These compounds can lead to tremendous increase in the quantity of microorganisms found in Virginia's lakes, tributaries, and the Chesapeake Bay. The metabolic activity of these microbes can reduce oxygen levels in the water causing aquatic life to suffocate. This process is referred to as eutrophication and it is considered to be the leading cause of the Chesapeake Bay's decline. Septic system failure is one of the leading sources of water pollution that contributes to eutrophication.

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