

Ground Water & Onsite Wastewater Treatment Systems



Key Message

why onsite wastewater treatment matters to ground water...

Nationwide, decentralized wastewater treatment systems (septic systems, private sewage systems, on-site sewage disposal systems) collect, treat, and release about 4 billion gallons of effluent per day from an estimated 26 million homes and businesses (USEPA, 2002). More than half of these systems were installed over 30 years ago when rules were nonexistent, substandard, or poorly enforced. The percentage of homes and businesses served by these systems varies from state to state, from a high of about 55% in Vermont to a low of about 10% in California (USEPA, 2002).

Onsite wastewater treatment systems (septic systems) have the potential to contaminate ground water and surface water resources, including drinking water supplies, with nitrates and other nutrients, chemicals, pathogens, and pharmaceuticals. However, when properly located, designed, constructed, and maintained, septic systems provide an effective and efficient means of treating domestic sewage and protecting water quality. Furthermore, there are economic and ecological advantages to managing wastewater within the watershed where it is produced.

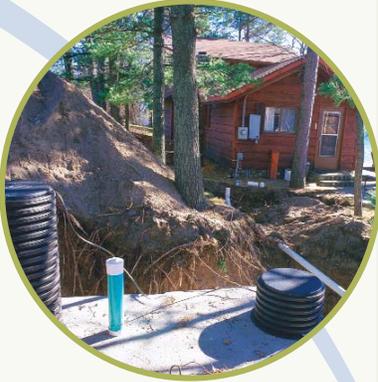
Thousands of unsewered communities and rural residences will continue to depend on onsite systems for wastewater treatment and disposal. Today, as the population migrates farther from metropolitan areas, about one-third of all new development is served by decentralized treatment systems (USEPA, 2004). Onsite systems allow communities to develop while providing them with the means for adequately handling wastewater. To minimize the

impacts of these systems on ground water, we need to:

- Ensure that onsite systems are properly designed installed, and maintained.
- Take full advantage of innovative designs and sound science.
- Adopt effective management solutions.
- Actively educate the public on what wastes should not be put into their systems, and how these systems should be maintained.



Curlew Lake in northern Washington State showing eutrophication along the shore near densely spaced septic systems. (Photo from Curlew Lake Eutrophication Study, 1986, Washington State University.)



A newly installed septic tank at a lakeside cabin. The tank has been installed in a hillside, which requires tall and short access points to facilitate periodic inspection and maintenance and accommodate slope.

- Responsibility for potential impacts on ground water from onsite systems also rests to some extent with local planning and zoning entities, whose zoning and subdivision requirements may or may not take into account the ability of the land to support a desired development density in a given area. Most health districts now restrict septic systems in vulnerable areas and have rules about spacing and density per acre. However, too few of these entities take into account the incremental effect of additional decentralized wastewater systems within a given water supply region or watershed. While the nutrient load from one septic tank system may be insignificant, the cumulative effect of adding more systems may trigger problems.

Recommended Actions



To USEPA and the Research Community:

- Fund and conduct demonstration projects to test the applicability of the various management models described in USEPA's *National Guidelines for Management of Onsite and Cluster (Decentralized) Wastewater Treatment Systems* (EPA 832-B-03-001) within a wide range of hydrogeologic and institutional settings (e.g., economic, legal, administrative, regulatory), including utilities that would install, manage, operate, and monitor performance-based septic systems located in areas of high-priority aquifers.
- Commission additional research regarding onsite system residuals, including emerging/unregulated contaminants such as pharmaceuticals, and the extent to which they are migrating to ground water, and compile and evaluate the latest advances in onsite wastewater treatment science and technology.

To USGS and State Geological Surveys:

- Conduct additional hydrogeologic and aquifer-vulnerability mapping at a scale that allows use by local and state governments for the purpose of siting onsite wastewater treatment systems and determining the need for advanced treatment for specific contaminants, including unregulated contaminants and pharmaceuticals and personal-care products.

To State and Local Agencies:

- Develop coordination protocols among all potentially involved agencies to promote more consistent regulatory oversight of both domestic and commercial onsite wastewater treatment systems.
- Encourage effective septic system siting, installation, inspection, and maintenance as described in USEPA's *National Guidelines for Management of Onsite and Cluster (Decentralized) Wastewater Treatment Systems*, and recommend that communities use one or more of the management models described in the guidelines.

To Homeowners:

- Operate your waste-disposal system according to recommended practices.
- Maintain your system on a regular schedule.
- If you sell your home, inform the new owner about your septic system and share maintenance records.

This summary sheet is taken from the "Onsite Wastewater Treatment" chapter of the Ground Water Protection Council's (GWPC) *Ground Water Report to the Nation: A Call to Action*. Contact GWPC for the full report.