

septic systems



The Water Resource Protection and Conservation Toolkit

This is one of a series of 12 fact sheets developed by the Northwestern Indiana Regional Planning Commission with funding from the Joyce Foundation for the Water Resources Protection and Conservation Toolkit. The toolkit provides background on, and methods to protect and conserve local water resources. These tools are intended to help citizens and local officials to manage and protect water resources for future generations.

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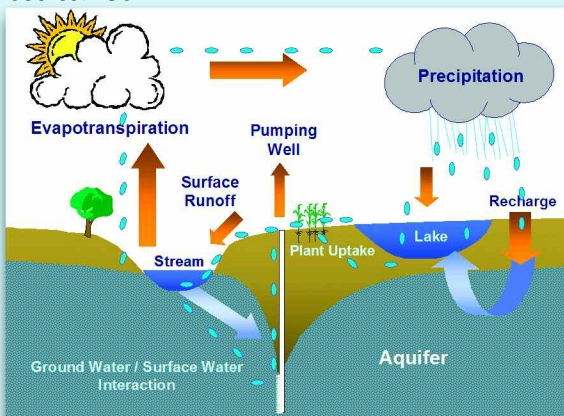
How Can Contamination of Water Resources by Septic Tanks be Avoided?

In many developing areas, there is a reliance on septic systems for sewage treatment. This is primarily due to the fact that these areas often are located far from existing sewer lines and larger wastewater treatment plants. This provides a unique challenge where there are individual or subdivision wells for domestic water use. Further, there is a higher risk of pollution in areas with higher densities of houses using septic systems.

Why Do Septic Systems Fail?

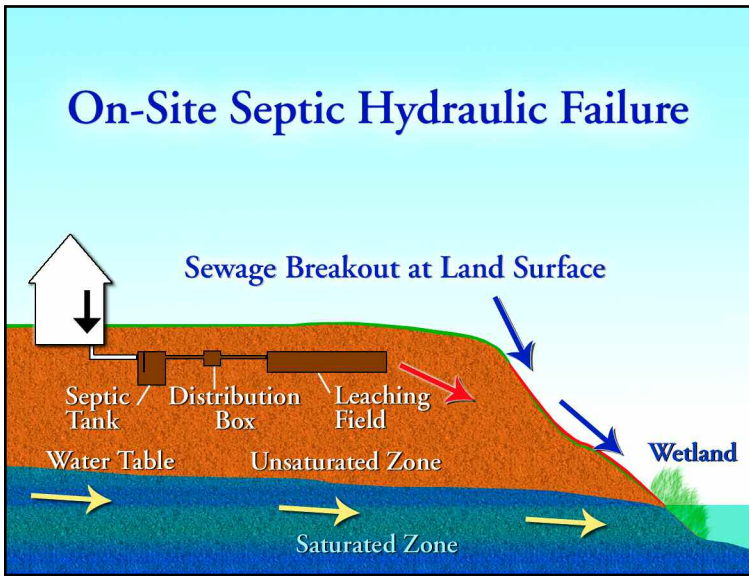
- Septic systems failures can occur when wastewater either breaks out at the surface or seeps into the soils and travels to groundwater sources, contaminating the water and threatening public health.
- In areas where both individual water wells and septic systems are used by homeowners, there is a greater danger of drinking contamination by septic system failure because of the relative proximity of the two systems. Check with the local health department to ensure a safe distance between a septic tank and a drinking water well.
- In areas where soils are sandy and less dense, there is potential that a septic failure will allow household wastewater to move quickly to the source of water serving homes in the area. Some research also indicates that septic failure rates are highest in well-drained soils because of inadvertent undersizing of leach fields.
- In areas with clay soils, septic failures lead to runoff of pollutants to surface waters as the clay does not allow water to easily move through soil underground.

Source: USEPA



Water Resources and The Natural Water (or Hydrologic) Cycle

Water resources can be significantly affected by development activities. Water resources move through the water cycle, sometimes called the hydrologic cycle. The water cycle is the continuous movement of water from ocean, lakes, rivers, and other water bodies to air and land then back to these water bodies through rain and snow in a cyclic pattern as water is used and re-used. Some water infiltrates (or seeps into) the ground or evaporates back into the atmosphere.



On-site Septic Hydraulic Failure

Source: USEPA

Maintaining Your Septic System

There are several things individuals must do to maintain a septic system:

- Have a professional pump out the septic tank every three to five years.
- Check the system when it begins to back up. Possible causes of septic system failure include:
 - * Tank needs to be pumped
 - * Tree roots have grown into trenches
 - * Pipe has burst
 - * Trenches are too wet due to large amounts of rainfall
 - * Volume of water used is too high (*see the fact fact sheet on water conservation*). This can be done in many ways such as using low-flow devices, detecting and repairing leaky faucets and toilets, washing larger loads of laundry instead of many small loads, and eliminating other wasteful water use habits.

If a septic system is not maintained properly, it is likely to fail. A failed septic system can pollute drinking water, for owners and nearby residents who also draw water from the same groundwater source. Once the drinking water supply is polluted, it is very hard to clean up.

General Resources

- Local health departments
- State Health Departments
- A Homeowner's Guide to Septic Systems, U.S. EPA
www.epa.gov/owm/septic/pubs/homeowner_guide_long.pdf
- Indiana Farmstead Assessment for Drinking Water Protection Household Wastewater Treatment,
www.ecn.purdue.edu/SafeWater/farmasyst/surveys/householdww.htm
This is a survey to assess the risk to groundwater quality posed by your household wastewater treatment.
- National Small Flows Clearinghouse Septic System Information website:
www.nesc.wvu.edu/nsfc/nsfc_index.htm
- The Practice of Low Impact Development, U.S. Department of Housing and Urban Development
www.huduser.org/Publications/PDF/practLowImpctDevel.pdf
Information on the proper selection and siting of septic tanks based on soil type.
- Purdue Residential On-site Wastewater Disposal web site on Protecting Drinking Water,
www.ces.purdue.edu/onsite/well.htm
- Source Water Protection Practices Bulletin: Managing Septic Systems to Prevent Contamination of Drinking Water,
www.epa.gov/safewater/protect/pdfs/septic.pdf
- U.S. EPA Septic Systems webpage:
<http://cfpub.epa.gov/owm/septic/home.cfm>

For more information on Septic Systems, see the Purdue Residential Onsite Wastewater Disposal webpage,

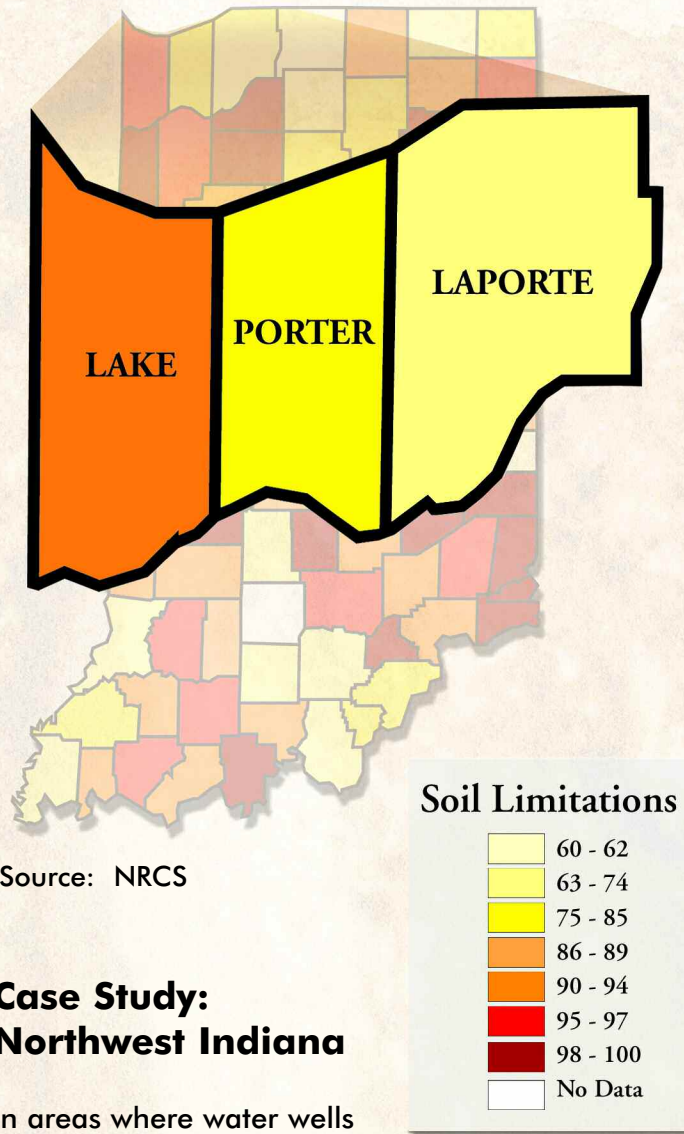
www.pasture.ecn.purdue.edu/~franken/NU-prowd/

This site has information on:

- How a Septic System Works
- Soil and Site Characteristics
- Maintaining a Septic System
- System Alternatives
- Designing a System
- Protecting Your Water
- Permits and Regulations
- Small Communities
- Other Resources

Limitations for Traditional Septic Systems by County

(Percentage Based on NRCS Criteria)
Higher percentage, the greater risk of failure



Source: NRCS

Case Study: Northwest Indiana

In areas where water wells and septic systems are used by homeowners, there is a greater danger of contamination by septic system failure. All of the soils in the Lake, Porter, and LaPorte Counties in northwest Indiana are rated as having moderate to extreme potential of septic system failure. The risks are different based upon soil type.

Most of central Lake and Porter Counties have a high failure potential. The potential is extreme in southern Lake and southern and southeastern Porter Counties. As such, care must be taken in installing and maintaining these on-site wastewater treatment systems.

Maintenance Costs versus Costs of Septic Failure

Maintenance Costs

- Design and installation costs range from \$3,000 to greater than \$10,000, depending on home size, site conditions and local ordinance requirements.
- Annual costs of septic systems, including the regular cleaning or pumping of the tank every two to three years, range from \$30 up to \$500 with the high end including replacement costs of pumps in mound systems. Annual costs for systems including constructed wetlands or sand and peat filters are \$50 to \$1,700. Over a 20-year life, total maintenance costs can range from \$6,300 to \$13,000 depending on the type of system.

Source: University of Minnesota Extension Service,

www.septic.umn.edu/homeowner0/NewsReleases/CostsAnd%20Financing.html

Costs of Septic Failure Caused by Improper Maintenance

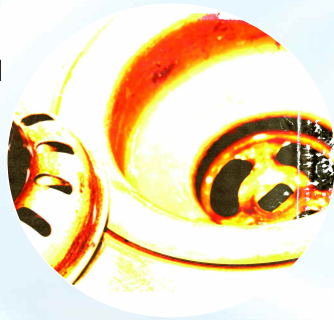
- Costs of obtaining alternative drinking water supply such as bottled water
- Costs of replacing a septic tank (\$3000 to 10,000) before its projected life span
- Impact on home resale value for septic tanks that cannot pass inspections

For more information, please contact:
Northwestern Indiana Regional Planning Commission
ph: 219.763.6060 • www.nirpc.org

Septic System Do's and Don'ts

DO

- ✓ Learn the location of your septic tank and drainfield. Keep a sketch of it handy with your maintenance record for service visits.
- ✓ Have your septic system inspected annually.
- ✓ Have your septic tank pumped out regularly by a licensed contractor.
- ✓ Keep your septic tank cover accessible for inspections and pumpings. Install risers if necessary.
- ✓ Call a professional whenever you experience problems with your system, or if there are any signs of system failure.
- ✓ Keep a detailed record of repairs, pumpings, inspections, permits issued, and other maintenance activities.
- ✓ Conserve water to avoid overloading the system. Be sure to repair any leaky faucets or toilets.
- ✓ Divert other sources of water, like roof drains, house footing drains, and sump pumps, away from the septic system. Excessive water keeps the soil in the drainfield from naturally cleansing the wastewater.



DON'T

- ✗ Go down into a septic tank. Toxic gases are produced by the natural treatment processes in septic tanks and can kill in minutes. Extreme care should be taken when inspecting a septic tank, even when just looking in.
- ✗ Allow anyone to drive or park over any part of the system.
- ✗ Plant anything over or near the drainfield except grass. Roots from nearby trees or shrubs may clog and damage the drain lines.
- ✗ Dig in your drainfield or build anything over it, and don't cover the drainfield with a hard surface such as concrete or asphalt. The area over the drainfield should have only a grass cover. The grass will not only prevent erosion, but will help remove excess water.
- ✗ Make or allow repairs to your septic system without obtaining the required health department permit. Use professionally licensed septic contractors when needed.
- ✗ Use septic tank additives. These products usually do not help and some may even be harmful to your system.
- ✗ Use your toilet as a trash can or poison your septic system and the groundwater by pouring harmful chemicals and cleansers down the drain. Harsh chemicals can kill the beneficial bacteria that treat your wastewater.
- ✗ Use a garbage disposal without checking with your local regulatory agency to make sure that your septic system can accommodate this additional waste.
- ✗ Allow backwash from home water softeners to enter the septic system.

Source: County of Marin, California,
www.co.marin.ca.us/depts/CD/main/comdev/ehs/septic/septic_system_do_s_and_don_ts.cfm