Onsite Wastewater Treatment Systems

Background for Water Quality State Guide Plan Advisory Committee
October 15, 2013

- What is an Onsite Wastewater Treatment System, or OWTS?
  - An onsite wastewater treatment system is a system of pipes, tanks, and chambers used to treat and disperse sanitary wastewater into the soil from buildings located in areas without centralized sewer service.
  - OWTS are commonly known as septic systems. Cesspools are an antiquated type of OWTS.
  - There are approximately 150,000 OWTS in Rhode Island, of which approximately 20,000 are cesspools. OWTS serve approximately 30% of the state's population and 80% of the state's land area.
  - OWTS most commonly serve an individual building (residence, business, industry or institution) and are located entirely on a single lot. They may also be designed to serve groups of buildings or even a neighborhood. The key distinction from a sewage treatment plant is that the treated wastewater is discharged into the ground rather than through a pipe into a river, bay, or ocean.
  - Design flow from OWTS range from 345 gallons per day for a 3 bedroom residence to greater than 20,000 gallons per day for some schools and other institutions.

- What are the impacted resources?
  - OWTS discharge treated wastewater to the soil, where it percolates downward and eventually into the groundwater. Groundwater is used to supply drinking water in many areas.
  - Groundwater is connected to surface waters of streams, ponds, and saltwater bodies with the result that OWTS have an impact on surface waters as well.
  - Wastewater from a failing or malfunctioning OWTS can flow over the land and directly into surface waters or into stormwater collection systems.

- What are the pollutants of concern?
  - Nitrogen, phosphorus, pathogens, chemicals and pharmaceuticals/personal care products.
  - Excess nitrogen and phosphorus can cause increased algal growth in salt and freshwaters, respectively. Excess algal growth causes changes to habitat for submerged vegetation, fish, and shellfish, decreasing the productivity and reducing the aesthetic quality of waterbodies.
  - Pathogens, nitrogen and improperly disposed chemicals are threat to drinking water wells.
  - Pathogens can cause shellfishing closures.
  - Research is ongoing to better determine the health risks and environmental impact of pharmaceuticals and personal care products.

- How are OWTS regulated and managed?
  - OWTS are regulated and permitted by DEM -- DEM rules for siting, design, construction and maintenance of all OWTS.
  - Rules set prescriptive standards for the OWTS components, size of systems based on intended use and soil conditions on each site, and the location of systems based on maintaining minimum separation distances from drinking water wells, wetlands and waterbodies, property lines, and other structures.
  - Private sector professionals are licensed by DEM to conduct soil evaluations, design systems and install systems.

- 25 types of alternative or experimental OWTS technologies and drainfields have been approved for use in RI. Through 2012, approximately 17,000 alternative or experimental technologies and drainfields have been installed in the state. These systems are used on difficult sites and to achieve water quality objectives (e.g., coastal pond watersheds).
- Operation and maintenance of existing systems is responsibility of property owner. All OWTS, whether passive conventional systems or alternative treatment systems with pumps and other electronic components, require periodic maintenance to achieve expected levels of treatment performance.
- 18 towns in RI have adopted onsite wastewater management plans to encourage or require maintenance activities such as inspections or pumping of septic tanks. These plans make the towns eligible for the Community Septic System Loan Program (CSSLP), in which the towns access funds from Clean Water Revolving Loan Fund for low interest loans to homeowners for OWTS repairs. As of September 2013, 37 loans have been issued to 12 towns over the past 15 years totaling $8,800,000.