



Water Lines Special Insert

The beast in the backyard

New guidelines focus on how states and owners can better manage septic systems

By Barry Topping, Senior Project Manager, Tetra Tech Inc. Reprinted with permission from the February 2001 issue of State Government News, a publication of the Council of State Governments

Late last summer, nearly 800 people who attended the Washington County Fair in New York became ill. Dozens were hospitalized and two died. Telephone surveys conducted in the weeks after the outbreak indicated that between 2,800 and 5,000 attendees might have developed gastrointestinal illness.

What caused this massive disease outbreak? Researchers at the New York Department of Health strongly suspect that a septic system serving a nearby dormitory contaminated a fairgrounds well that provided water for mixing beverages served to thousands of attendees. DNA analysis of bacteria samples from the septic system, the well and those who became ill were indistinguishable.

For many public-health professionals, such disease outbreaks are uncommon but not rare. Septic systems across the nation are regulated under a patchwork of state and local laws that focus primarily on permits and installation, with operation and long-term maintenance often left to untrained and mostly uninformed homeowners.

But a group of local health department officials, state agency representatives and federal water-pollution program managers want to improve the situation. Part of their approach involves the development of voluntary management guidelines for public or private entities that oversee septic systems. Their "Guide-

lines for Management of Onsite/Decentralized Wastewater Systems," which was the subject of a notice published in the *Federal Register* on October 6, outlines a series of five management tiers in the form of model programs. Septic-system oversight agencies in areas with few problems and relatively low risk to water resources may opt for a simpler, less comprehensive approach, while those with higher system densities and threatened waters may wish to adopt a more protective program. (More information on the guidelines is available at www.epa.gov/owm/decent/index.htm.)

A nationwide concern

Onsite wastewater-treatment (septic) systems collect, treat and release about 4 billion gallons of effluent *per day* from an estimated 26 million facilities nationwide. These systems, which include septic tanks attached to leach fields, sand mounds, organic infiltration units, constructed wetlands and other technologies, serve nearly a quarter of the homes in the country. More than half are over 30 years old, and many are experiencing problems. Poor performance — partially treated sewage pooling on the ground or flowing into drinking water wells or surface waters — can threaten public health or cause nuisance algal blooms in lakes, rivers or coastal waters. And poor performance is all too common.



STATE AND TRIBAL AGENCIES REPORT THAT SEPTIC SYSTEMS ARE THE THIRD MOST COMMON SOURCE OF GROUND-WATER CONTAMINATION.

State and tribal agencies report that septic systems are the third most common source of groundwater contamination. These agencies also have identified more than 500 communities with failed septic systems that have caused public-health problems. A national survey of recreational beach managers found that septic systems are thought to be a leading source of

pollution for 36 percent of water-quality impairments at beaches. The discharge of partially treated sewage from malfunctioning septic systems also is a principal or contributing source of pollution in 32 percent of all harvest-limited shellfish areas, resulting in a considerable economic impact on the shellfish industry.

Onsite wastewater-treatment systems can contribute to an overabundance of nutrients in ponds, lakes and coastal estuaries, leading to the excessive growth of algae and other nuisance aquatic plants. Septic systems also contribute to contamination of drinking water sources. The U.S. Environmental Protection Agency estimates that 168,000 viral and 34,000 bacterial illnesses each year occur as a result of consumption of drinking water from systems that rely on improperly treated groundwater. Malfunctioning septic systems have been identified as one of several potential sources of this contamination.

Septic systems are recognized as a viable, low-cost, long-term approach to wastewater treatment, but only if they are properly planned, designed, installed, operated and maintained. In order to be effective, management programs should ensure that these systems provide treatment comparable to that provided by centralized wastewater-treatment plants.

Most septic systems are of the conventional type, consisting of a septic tank and drain field, which leaches partially treated wastewater into the soil for further treatment. However, some sites are not suitable for soil-based treatment systems. According to the EPA, only about one-third of the land area in the United States has

the type of soil needed to adequately treat wastewater from septic tanks. In addition, system densities in some areas exceed the capacity even of suitable soils to assimilate wastewater flows and contain their contaminants. Many systems are located too close to groundwater or surface water, while others, particularly older systems in rural areas with newly installed public waterlines, are not designed to handle increasing wastewater flows. Another problem is ensuring proper operation and maintenance — such as pumping septic tanks every three to five years and repairing failed systems promptly.

A more comprehensive approach

State and local health and environmental-protection officials now acknowledge that septic systems are not just temporary installations that will be replaced eventually by centralized sewage-treatment services, but permanent approaches to treating wastewater for release and reuse in the environment. The voluntary management guidelines can be tailored to meet the needs of states, counties, cities, towns, subdivisions and other areas where onsite systems may threaten public health or water resources. The guidelines focus on a few key areas in which better management can achieve significant improvements in overall system performance.

- Planning to ensure that the number of septic systems in an area does not exceed the ability of the soil and water to treat and assimilate pollutants.
- Site evaluations to characterize and help protect soil, groundwater and surface-water resources.
- System designs to provide predictable treatment performance levels that protect public health and the environment.
- Operation and maintenance procedures to ensure that systems are managed properly and that maintenance tasks (for example, septic-tank pumping and inspection of treatment units) are performed regularly.
- Monitoring and reporting to provide usable and easily accessible records on system inventories, design, capacity and performance.

- Follow-up and corrective actions to ensure that failing systems are repaired, upgraded or replaced before public health or water resources are affected.

Who will pay?

While homeowners and businesses served by centralized sewage-treatment plants have traditionally enjoyed the benefits of publicly financed grants and loans, most septic-system owners have been responsible for paying for their own system installation, operation and maintenance. However, the situation is changing. Nineteen states now provide cost-

share funds, grants or low-interest loans to septic-system owners. For example, Pennsylvania's PENNVEST program spent \$1.8 million on 230 onsite system projects through 1999. Federal funding for system installation or repair is available from the

Community Development Block Grant Program, the Rural Utilities Service of the U.S. Department of Agriculture, the EPA Clean Water State Revolving Fund and other sources.

Many of these sources also can provide money for developing a management program. For example, a local health agency or other management entity may need funds to purchase a septic-tank pumper truck, develop GIS maps of system locations or conduct other management activities. Despite the availability of resources, however, other obstacles exist. Some state codes deter or prevent health agencies, sanitation districts or other public institutions from managing onsite systems after they are installed. In addition, property law may prevent management-agency staff from conducting inspections or monitoring performance of septic systems. Proponents of better system operation — including drinking-water utilities, public-health officials and system manufacturers and installers — are working through these obstacles to create management entities that can help ensure long-term system performance.

Maintaining the viability of onsite wastewater treatment across the nation in places not served by public sewage-treatment plants will improve the reputation of the proverbial “beast in the backyard.” Better approaches to planning, design, operation, maintenance and management will help.

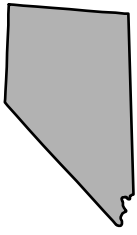
Fertilizing the waters

Ponds, lakes, and coastal bays across the nation have been impaired by algal blooms caused in part by failing septic systems that release too many nutrients. For example, in Sarasota Bay, Fla., the county's 45,000 septic systems contribute four times more nitrogen to the bay than the city's wastewater treatment plant. Septic systems are adding an estimated 1.5 million pounds of nitrogen per year to Florida's Indian River Lagoon, causing a decrease in freshwater wetlands and a decline in commercial shellfish harvests.

How do septic systems work?

Nearly all onsite wastewater-treatment systems include a septic tank, which digests organic matter and retains liquids such as oil and grease that float and solids that settle. Soil-based systems discharge septic tank effluent into a series of perforated pipes buried in an infiltration field, into leaching chambers or into other special units designed to slowly percolate effluent into the soil. Alternative systems use pumps or gravity to trickle septic-tank effluent through sand, organic matter (for example, peat or sawdust), constructed wetlands or other material to remove or neutralize pollutants such as disease-causing pathogens, nitrate, phosphorus and other contaminants. Some alternative systems are designed to evaporate wastewater or disinfect it with chlorine or ozone before discharging it into the soil or surface waters.

**THE VOLUNTARY
MANAGEMENT GUIDELINES
CAN BE TAILORED TO
MEET THE NEEDS OF
STATES, COUNTIES,
CITIES, TOWNS...**



Safety Training and Resources in Nevada

Compiled by Marlyn Rinta, Kingsbury GID

Safety and safety training are everyone's concerns. There are several resources in Nevada that offer training, classes and/or videos free of charge or at minimal cost.

State of Nevada, Division of Industrial Relations

The State of Nevada, Division of Industrial Relations (safety consultation and training section) has an office in Reno and Las Vegas. The classes are free and can be given at your site if your site is within an hour of their office. A minimum of 15 people are required to attend the class. If your site is more than an hour (driving time) from their office, at least 30 people are required to attend. The following is a partial list of current classes:

- Keys to Unlock Workplace Safety, 7 ¼ hours
- Machine Safeguarding, 3 to 4 hours
- OSHA 10-hour construction course
- OSHA 30-hour General Industry Outreach Program
- Forklift Safety Awareness, 3 hours
- Defensive Driving Course, 4 hours
- Hazard Communication — Modules I and II, 2 hours and 4 hours
- Hearing Conservation Program, 4 hours
- Industrial Accident Investigation, 8 hours
- Introduction to OSHA, 2 hours
- Respiratory Protection Awareness, 2 hours
- Safe Work Practices in Confined Spaces, 5 hours
- Workplace Violence Awareness, 7 ½ hours
- Asbestos Awareness, 2 to 3 hours
- Blood Borne Pathogens Awareness, 2 to 3 hours
- Confined Space Awareness, 3 hours
- Control of Hazardous Energy "Lockout/Tag-out," 2 to 3 hours

For training course descriptions, contact Jerry Burnette in Reno, 775/688-1474, and Mary Jo Brown in Las Vegas, 702/486-9143. The instructors make the classes interesting and fun.

Nevada Public Agency Insurance Pool

The Nevada Public Insurance Pool also has a wide variety of training videos and training courses. The agency only provides videos and training to members of the pool. For information on becoming a member and available training courses, contact Craig Bucholi, 775/323-1656.

Sierra Pacific

The Sierra Pacific, (Glendale Water Treatment Plant) soon to be Truckee Meadows Water Authority, offers a very good selection of training videos and classes at no charge. Contact Debra Kay, 775/834-8114. A partial list of videos and courses includes:

- Basic Lab Procedures, July 11, 2001
- Fluoridation/ Iron and Manganese, Aug. 7, 2001
- Softening/THM's, Sept. 5, 2001
- Math, October 16, 2001
- Pumps/Regs, Nov. 14, 2001
- Instrumentation, Dec. 11, 2001

A list and schedule for 2002 is available upon request. The classes are held at the Glendale Water Plant at 2 p.m. Classes may change due to operation conditions, so prior confirmation is recommended.

Carson City Risk Management

The Carson City Risk Management Division has an extensive library of training videos, manuals and mandated regulations that may be available for training on a case by case basis. Contact Tony Baker in Carson City at 775/887-2308.

University of Nevada T2 Center

The University of Nevada T2 Center offers several training courses. The courses are \$20 per person for agencies such as state, city, counties, GIDs and \$40 for the private sector. A flagger certification course is offered for \$35 per person. A partial list of classes includes:

- Roadway Drainage
- Work Zone Safety and Traffic Control
- Workplace Safety
- Equipment Safety
- Shop Safety
- Tort Liability/Nevada Traffic Laws
- Effective Communication Skills

Contact Lisa Cody at 775/784-1433 for course schedules and applications.
