

POLLUTION PREVENTION FACT SHEET: SEPTIC SYSTEM CONTROLS

Description

Septic system source control refers to the use of outreach programs to educate homeowners about the proper operation and maintenance of their septic systems to reduce the likelihood of failure. Septic systems are designed to treat wastewater by separating solids from liquids and then draining the liquid into the ground. Sewage flows into the tank where settling and bacterial decomposition of larger particles takes place, while treated liquid filters into the soil. When system failures occur, untreated wastewater and sewage can be introduced into groundwater or nearby streams and water bodies.

Pollution prevention practices are designed to restrict pollutant and nutrient loads from improperly functioning septic systems from entering local water sources. These loadings occur for a number of reasons, including improper siting, inadequate installation or system operation failures (See the Non-Stormwater Discharges Fact Sheet on Failing Septic Systems). As many as 75 percent of all system failures have been attributed to hydraulic overloading (Jarrett *et al.*, 1985). Failures may also occur due to lapses in the regular inspection and maintenance that is required to ensure proper operation during the design life of the septic system. Homeowners may be unaware of the age of their system and whether preemptive planning is necessary before the system fails.

Applicability

Outreach regarding septic system controls is applicable mainly to large lot development in rural areas that are not served by sewer. When septic systems are used for wastewater treatment, there is a need for educational outreach and training to avoid system failure for owners of both new and existing systems. Septic system maintenance education is extremely important for coastal shoreline developments near shellfish beds and spawning areas, where septic effluent discharges can influence water quality and lead to bed closures and algal blooms. There is also a significant need for educational outreach regarding septic system maintenance near lake shoreline developments, where nitrogen inputs can lead to lake eutrophication.

Implementation

The most effective way to control on-site wastewater problems is through a comprehensive management program. An on-site wastewater management program can reduce water quality degradation and save local governments and homeowners time and money, as well as better track the performance of routine maintenance practices. This comprehensive plan is administered by one agency that has ultimate responsibility for all aspects of wastewater management, including on-site disposal systems (for more information see the Septic System Ordinance in the Illicit Discharges Ordinance Category).

Public outreach and training are vital elements to the control of septic system failure. Many of the problems associated with improper septic system functioning may be attributed to a lack of homeowner knowledge on operation and maintenance of the system. Educational materials for homeowners and training courses for installers and inspectors can reduce the incidence of failure. Education is most effective when used in concert with other source reduction practices such as phosphate bans and use of low-volume plumbing fixtures. Simple messages that can be conveyed to homeowners to reduce system failures and ensure proper functioning are listed in Table 1.

Table 1. Steps That Can Reduce Pollutant Loadings from Septic Systems	
1.	Do not wait until septic system shows sign of failure. Inspect the system annually and have it pumped-out at least once every three years.
2.	Keep records of pumping and maintenance and a map of the location of your system and drainfield.
3.	Practice water conservation indoors and divert roof drains and surface water away from the system.
4.	Use caution in disposing materials down the drain. Household chemicals can kill the bacteria that make the system work and non-degradable materials (cigarette butts, etc.) can clog the system.
5.	Keep heavy equipment and vehicles off your system and drainfield.
6.	Don't cover your drainfield with impermeable surfaces that can block evaporation and the air needed for effluent treatment.

In addition to the general suggestions above, there are other management measures which can be implemented to help maintain a properly operating system. These include:

Chemical Additive Restrictions

Organic solvents are often advertised for use as septic system cleaners. There is little evidence that such cleaners perform any useful functions, and may instead exterminate the microbes necessary for waste treatment, resulting in increased discharge of pollutants. In addition, the chemicals themselves often contain constituents that are listed with US EPA as priority pollutants. Restrictions on the use of these additives can prevent improper system operation and groundwater contamination (US EPA, 1993).

Phosphorus Detergent Restrictions

Conventional septic systems are usually very effective at removing phosphorus. (See the Non-Stormwater Discharges Fact Sheet on Failing Septic Systems). However, certain soil conditions combined with close proximity to sensitive surface waters can result in phosphorus pollutant loading. If such conditions are sufficiently prevalent within areas of concern, restrictions or bans on the use of detergents containing phosphate can be implemented. Eliminating phosphates from detergent can reduce phosphorus loads to septic systems by 40 to 50 percent (US EPA, 1993). As of October 1993, 17 states had enacted phosphate detergent restrictions or bans (Osmond *et al.*, 1995).

Elimination of Garbage Disposals for Households Served by Septic System

Garbage disposals contribute to the loading of suspended solids, nutrients, and BOD to septic systems, as well as increasing the buildup of solids in septic tanks. Garbage disposals can double the amount of solids added to a septic tank, creating the need for more frequent pumpouts.

Limitations

As with all pollution prevention measures, public unawareness about the suggested practices may be the biggest limitation to septic system source control. Many residents appear to be either unaware of or unwilling to implement the necessary steps to ensure the proper operation and maintenance of their septic systems. A recent survey of residents in the Chesapeake Bay region found that 50 percent of septic owners had not had their systems inspected within the last three years and that 46 percent had not had their system cleaned within the same time frame (Swann, 1999). 12 percent of residents did not even know where their septic system was located. This indicates that residents are not receiving the necessary information on septic system care to prevent or reduce the incidence of failure. For more information, see *Understanding Watershed Behavior*, Article 126 in *The Practice of Watershed Protection*.

Effectiveness

Failing septic systems have been linked to water quality problems in streams, lakes, shellfish beds and coastal areas. Improvements in system operation and maintenance should be a strong element in watershed plans for those areas where septic systems are used for wastewater treatment (for more information see *Dealing with Septic System Impacts*, Article 123 in *The Practice of Watershed Protection*). Public education and outreach regarding septic operation and maintenance can be assumed to produce some positive effect on water quality, but studies on resident behaviors regarding septic pollution prevention practices are limited. Instead, effectiveness of septic source controls is most often measured in the number of informational packets mailed out or the number of attendees for training workshops. While this may help to define the demand for information, it gives no indication of whether the operation and maintenance practices presented are even implemented. To better determine whether pollution prevention outreach is being effective, residential surveys should be part of any program seeking to educate residents on septic systems and their influence on water quality.

Cost

The cost of septic system pollution prevention programs can vary greatly, depending on factors such as staff time, outreach components, and the extent of septic use within a region. Table 2 gives some examples of programs from various parts of the country and the expenditures for septic outreach. Once a program is well established, the cost of creating educational materials and training programs decreases and funding can be redistributed to those outreach techniques that have proven to be the most successful. Programs should be sure to secure some funding for media outreach (especially television), as this often ranks as the most popular information source in surveys of resident preferences.

Table 2. Some Examples of Cost and Staff Time for Septic Outreach Programs

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Program	Expenditure	Staff time (Full time equivalent)	Components
City of Olympia, Washington	\$40,000	1/2	Flyers/brochures Training workshops System monitoring
Thurston County, Washington	\$35,000	1/2	Flyer/brochures Discount coupons for septic pumping Training workshops
Minnesota Cooperative Extension	\$18,000	1/4	Publications/videos Flyers/brochures Training workshops/community visits Septic owners guide distributed with new permits Satellite conferences for policy makers Train the trainers program

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