

THE DECENTRALIZED REVOLUTION SEWAGE FACILITIES MANAGEMENT – FULL CIRCLE

History of Modern Sanitation

Local authorities, responsible for the execution of public health laws in the 1850s, were generally unprepared, uninformed of the requirements, reluctant to implement them, and dreaded the expense. In many places, sewers were finally constructed in the 1880s under pressure from public health advocates and in response to several deadly epidemics. By 1905, many towns – like yours? – had sewers, although very few had treatment facilities (one was in Reading, PA, in 1897).

Interest in resource conservation, continuing public health concerns, and the development of treatment technologies resulted in the Water Pollution Control Act of 1948, as amended through 1965 – when your plant was built?

Water quality continued to suffer until treatment facilities were built or upgraded with Federal funds in response to the national pollutant standards set by the Clean Water Act of 1972.

In Pennsylvania, the Sewage Facilities Act of 1966 grew out of the public health laws of the 1920s.

The average human life expectancy increased nearly 35 years in the 20th century, of which 30 years are attributable to sanitation, although world-wide water pollution leads to 9,000 deaths daily, mostly among children.

Centralized Systems

Centralized systems – those that collect wastewater and convey it to one central location for treatment and disposal – became the standard management model due to increasing urbanization, piped

water and indoor plumbing (that overloaded the cesspools), public health issues, development of the sanitary engineering field with expertise from Europe, lower costs to operate and maintain, and homeowner convenience (no maintenance). But, not until the public demanded action and financial support was provided.

Centralized systems, typically owned and operated by local government, are commonly referred to as “the Big Pipe.”

Onlot Systems

In rural areas, the Federal government encouraged the use of outhouses in the 1920s and 30s. With technical advances, onlot septic systems improved by the 1960s to drainfield disposal. Improved facilities are under constant development. Today, approximately 25 percent of Americans rely on septic systems, and 37 percent of new construction is served by onlot systems.

Onlot systems are typically owned and operated by private entities or individuals.

Decentralized Systems

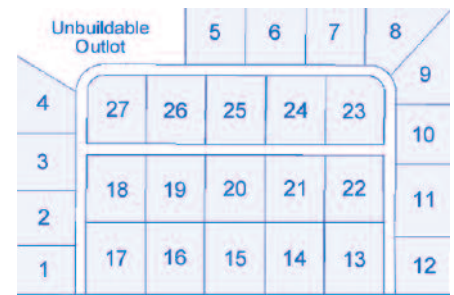
A decentralized system consists of an individual onsite system or a cluster system that treats, reuses, or disposes of wastewater onsite or near the source of waste generation.

Decentralized systems can offer the following advantages:

- Return treated wastewater within the watershed of origin
- Eliminate large and more expensive sewers
- Reduce the risks and impact from system leaks or failure

- Recharge the groundwater supply
- Re-use water and nutrients
- Lower capital costs and sustainable life-cycle costs

Decentralized systems are often selected based on their ability to enhance sustainable growth and land preservation. Sustainable development plans with wastewater systems that only serve the development can reduce the impact of acres of lawns, allow farmland or wood lots to remain as conservation areas, and are growth-neutral. Good illustrations that compare the plans of a typical 100-acre, 27-lot development with a 100-acre, 27-lot conservation development follow:



Typical Development



Conservation Development

Wastewater Management

To protect public health and environmental quality, all wastewater works are regulated as a public service by state and local government, and managed through a combination of planning, siting, design, permitting, construction, operation and maintenance, and rehabilitation, including repair, upgrade, or replacement.

PA Chapter 71, Subchapter E, Sewage Management Programs, states, "Municipalities are required to assure the proper operation and maintenance (O&M) of sewage facilities within their borders."

Municipal public sewer systems comply with the regulations through legal (permits), administrative (municipal and authority boards), and financial (user fees) means. Private system planning, siting, and design are regulated and permitted. Construction is overseen by the system owner.

Homeowners are responsible for the operation and maintenance of their onlot system (or their lateral to a centralized system), but often no action is taken until there's a problem. Just as public sewer system components such as pump stations or sewer mains are long-term wastewater treatment components, private systems must also be maintained to function properly and to extend service life.

Onlot systems (and many small package plants) were installed assuming that they were temporary until "the Big Pipe" sewer extensions are constructed. However, in 1997, in response to a call from Congress, EPA issued a policy stating, "onlot systems are a cost-effective and long-term option to wastewater treatment and disposal if managed properly."¹

Barriers to Decentralized Systems

Mirroring the resistance to the construction of sewers in the 1840s, the EPA has identified barriers to the use of decentralized systems including a lack of knowledge and misperceptions by local governments, engineers, regulators, developers,

and the public, the lack of political will and financial support.

To ensure the continued use of existing onlot systems and to construct new decentralized systems, training for engineers and public education needs to be provided, sewage management programs need to be established and implemented by local governments, restrictive zoning and development ordinances need to be revised to meet the community's goals, engineers need to design or specify "low-tech" alternatives, regulators must allow or permit decentralized systems, and residents need to realize the impact of their actions or lack thereof on and beyond their lot line.

The decentralized concept provides flexibility to address a variety of situations within a service area (e.g., individual on-site systems in low density areas, cluster systems for pockets of development, and centralized systems in impacted or urban areas). As this implies, centralized systems do have a place within the decentralized concept.

Centralized Management of Decentralized Systems

A regional "centralized" management entity can cost-efficiently assure that all the wastewater management activities in its service area are addressed in the most responsible manner, not just those areas served by conventional sewage facilities. A municipality or municipal authority that already manages a public sewer system could include the management of decentralized systems under its wing or delegate management to another entity with the resources and authority to complete the work.

For most communities in Pennsylvania, centralized management of decentralized systems could ensure management programs that balance property owner's rights with the good of the community, and insure property values and economic prosperity and equity.

The Decentralized Revolution

We've come full circle – from decentralized cesspools in the 1800s, to centralized sewage facilities, to current decentralized concepts – as improvements and management allow each change to succeed. Today the circle encloses all the techniques and technologies available on a continuum between individual onlot systems and a fully centralized system.

The full complement of options expands our ability to meet our responsibilities to the public good and the natural environment that minimizes environmental liability, enhances our quality of life, and ensures healthy and productive lives.

References

- Onsite Wastewater Treatment Systems Manual, EPA, 2002.
- Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems, EPA, 2003.
- Decentralized Wastewater Treatment Systems – A Program Strategy, EPA, 2005.
- www.nesc.wvu.edu/nsfc/nsfc_index.htm

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¹cfpub.epa.gov/owm/septic/index.cfm

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