

Decentralized is the Right Choice for Communities

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Sustainable Wastewater Solution: Decentralized Systems

Sustainable development through sustainable designs for water and wastewater infrastructure is a means of accomplishing balance. The traditional answer in the past for most communities was to move toward centralized wastewater collection and treatment. As funding for these systems has become scarce and effective alternatives more prevalent, decentralized treatment is becoming the solution of choice for many communities.

In the decentralized approach groundwater is extracted, utilized, and treated onsite; then it is returned close to its point of origin to recharge the aquifer. From small residential systems to large scale facility or community discharges more than a million gallons per day, these natural approaches provide suitable long-term treatment solutions, better development practices, and can be more cost-effective than centralized systems. Due to the compactness of the model there is less energy consumption.

By any measure of success The Clean Water Act (CWA) has not met its intended goals. The CWA was passed in 1972 with a 1983 deadline for compliance. Now over 40 years later, centralized sewers continue to pollute as a routine and for a large number of communities they are simply not financially sustainable. The following list is just a small subset of data available:

- The estimated volume of CSO discharged nationwide is 850 billion gallons per year.
- In 2000, the United States Environmental Protection Agency (USEPA) estimated 40,000 SSOs and 400,000 basement backups annually.
- A 1981 survey conducted by the National Urban Institute indicated an average of 827 backups and 143 breaks per 1,000 miles of sewer pipe per year. Breaks occurred most often in the young, growing cities of the South and West.
- Scranton, Pennsylvania combined sewer system, which frequently discharges raw sewage into the Lackawanna River and its tributaries, is part of the Chesapeake Bay Watershed. The volume of combined sewage that overflows from the system is approximately 700 million gallons annually.
- The city of Indianapolis, Indiana signed a consent decree with the US EPA to make more than \$1.86 billion in improvements to curb overflows from its sewer system. The settlement will be the third highest-cost CWA settlement, and will ultimately reduce the volume of Indianapolis' untreated discharges by 7.2 billion gallons in an average year.

The conclusion that is easy to draw from these examples is that after 40 years communities are still quite far from complying with the original Clean Water Act. The centralized wastewater treatment model for many communities is financially unsustainable.

The Decentralized Choice

Decentralized systems can treat to the same level as centralized systems. The technologies available for large-scale systems are now available for small-scale systems as well, such as membrane treatment systems. Although, because of advances on the treatment and disposal side, decentralized systems are no longer limited to small flow systems. Today there are several facilities operating at a capacity of over 1 MGD. In addition, owners and developers do not have to wait for sewer extensions to reach their site or the treatment plant to be expanded to move forward with a development project.

Every community is unique and needs vary greatly. When communities choose a sustainable development and wastewater treatment path, they base the choice on factors including community planning, anticipated growth, economics, and environmental sensitivity. But what questions should community leaders and residents ask before determining the best route to take?

1. What are the projections for community growth and anticipated wastewater treatment needs?

Community planning is at the core of selecting the best sustainable wastewater treatment plan for the future and each community has to choose its own path. Centralized sewers offer the possibility for large-scale rapid commercial and residential growth, but many communities want to avoid that and retain historic and community character. With decentralized treatment, a community can focus on only treating the areas of town that are causing a problem or have the potential to do so. This allows for smaller design flows, smaller disposal areas, and therefore lower costs. This also places the financial burden on those properties where issues are seen or anticipated.

2. What wastewater treatment challenges currently exist?

Officials need to know and thoroughly understand the problems in the community such as leaking sewers, an over-capacity system, underfunding, watershed issues, groundwater pollution, and regulatory non-compliance. They should also properly document the issues and enable citizens to become informed about them and the proposed solution.

3. What treatment options are available?

Decentralized, centralized, or a melding of the two are the most common choices. When evaluating the options hiring an expert in each model can be an important step to making the best choice without being bias-directed toward only one of the options.

4. What are the true costs?

Decentralized treatment can offer many cost advantages. Design, permitting, legal, land purchase, and construction costs all need to be dealt with short term. Long-term costs include O&M, licensed operators, billing structure, district vehicles (specialized trucks), and specialized equipment. Cost savings can be a significant advantage in the decentralized approach. In some areas in the U.S., the average cost per unit to connect to a new wastewater treatment facility or a sewer extension is between \$54K and \$60K*. This is unfathomable for most communities.

*Meyer, M., NYCDEP Section Chief - Community Planning, On-Site Wastewater Treatment Programs in the Watershed – A Status Update,

<http://www.dos.ny.gov/watershed/2012presentations/2012%20WSTC%20-%20Wastewater%20Programs%20-%20Meyer%20-%20Final.pdf>.

Conclusion

Communities have options when facing their wastewater challenges. In spite of the perceived benefit of centralized sewers, they continue to be the primary contributor to surface water pollution 40 years after the Clean Water Act passage. While the centralized model is applicable to highly urbanized areas, the notion to continue with this model is in question for the outlying areas. The key to communities making the right choice and achieving success is to conduct a thorough feasibility analysis by qualified professionals.

There are numerous case studies available that demonstrate the feasibility of the decentralized model and several worksheets published by the United States Environmental Protection Agency can be found at <http://water.epa.gov/infrastructure/septic/Decentralized-MOU-Partnership-Products.cfm> and provide more detail on the benefits of decentralized treatment.

With more than 25 percent of the United States and Canada utilizing decentralized systems to provide wastewater treatment, designers, regulators, and contactors who understand decentralized benefits can become advocates of the industry.