

Decentralized Wastewater Treatment

An application used worldwide, now growing in US to address the needs of small communities and developments

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Conventional sewer operations managed by small communities provide centralized treatment of wastewater of which residents are accustomed. But the expense of operating these systems as they expand with miles and miles of sewer lines is staggering. Expanding sewer line infrastructure, increased pumping costs and staffing a plant with operators have caused small communities and home developers to look at alternatives which can meet or exceed strict government regulations as they relate to the public's health and water.

A proven option has been decentralized wastewater treatment systems. One of the critical advantages of a decentralized system is its return of treated water back in to the immediate, local environment. Water is becoming more and more an important commodity as resources diminish. We have a finite amount of water which is used over and over. With most centralized wastewater



Conventional sewage treatment is expensive to operate. Some small communities are looking for alternative ways to manage wastewater.

treatment facilities the water's origin is a local aquifer from which water is pumped, treated and piped to homes and businesses for use. Once used, this wastewater is treated at the centralized facility and pumped miles away, often times to a river system which takes the water hundreds of miles from the community. The decentralized system replenishes the local groundwater and aquifer with safely treated water to be used again by the community.

Another advantage is the decentralized system's modular capabilities. Developers and small

communities have the ease of adding homes as they are built. Often times, a developer has to complete the entire sewer system for a centralized operation, which is costly. With a decentralized system, homes are added as soon as they are individually ready. Modules can be easily added to a treatment system that has been sized for future expansion at less cost, providing higher environmental returns for the community.

Today's technology has improved efficiency of a decentralized system while bringing installation costs down for communities and individuals. These systems can reduce the time, energy and water involved with treating wastewater while providing a higher pollutant removal rate. Annual financial and environmental benefits are shared by homeowners, developers and cities by treating and reusing water near the point of origin. One example is Dawn Community of Caroline County, Virginia.

Dawn Community had 153 residences spread out over a wide 55,000-acre area. The homes had either failing septic systems, portable toilets or no indoor plumbing whatsoever. The Dawn Wastewater and Housing Rehabilitation Project (DWHRP) realized the severity of the situation and wanted to fix it but the county could not afford the capital to install and then operate a traditional centralized wastewater system. With the area made up of lower-to middle-income homes the county did not want the monthly service charge per home to exceed \$25 per month.

Caroline County hired an engineering firm to find a solution. The treatment system selected centered on a Bio-Microbics product called the FAST (Fixed Film Activated Sludge Treatment) system. The treatment plant site, which is about 1,000 feet from the closest home, consists of six FAST units. The FAST process is a fixed-film, aerated system utilizing a combination of attached and suspended growth, capable of nitrification and denitrification in a single tank. It combines the stability of a fixed-film media and the effectiveness of proven, activated sludge treatment, making it very reliable.



Bio-Microbics FAST System installed in the Dawn Community in Caroline County, VA.

One of the advantages of this system is the ease of installation. Little labor is required in the field since the tank the FAST unit is installed into is precast. The precast concrete tank is simply placed in a hole and backfilled around it. Then, the Bio-Microbics FAST unit is bolted in place and the concrete top placed on top. This installation can be done by two people.

Caroline County had initially planned for 150 homes to be connected to the decentralized system, but 20 more signed up, with more completing applications. It was estimated that

200 homes will be served by the six FAST units. And if more FAST units are needed in the future they can be easily installed in just a few days at costs substantially less than a centralized system. For more information on the Dawn Community project in Caroline County, and other cases studies, visit www.biomicrobics.com

Bio-Microbics multi-family systems provide small communities, subdivisions, apartment buildings and other clustered residential developments with innovative, affordable alternatives to a centralized wastewater plant. The MicroFAST wastewater treatment system is engineered to fit most treatment capacities for multiple homes, providing advanced wastewater treatment options over the conventional septic system alternative. The MyFAST wastewater treatment system is ideal for HS-STP™ (High Strength-Sewage Treatment Plant) projects, such as small communities, to offer lower cost options versus centralized sewerage. This simple in-design and easy to install MyFAST® is a pre-packaged, decentralized treatment system for up to 160,000 gal/day (600 m3/d). The BioBarrier® HSMBR (High Strength Membrane Bioreactor) exceeds typical treatment effluent requirements of the local regulations, producing high-quality effluent that provides new opportunities for wastewater recycling techniques.

installations in over 60 countries. Through a worldwide distributor network, Bio-Microbics has been recognized as a leader in exporting decentralized equipment with receiving the 2011 KS Exporter of the Year Award and the 2012 President's "E" Award for Excellence in Exports. For more information and testimonial application videos visit www.biomicrobics.com

About the sponsor: For over 35 years Bio-Microbics, located in Shawnee, Kansas, has a real world operating history with more than 42,000