

per·se·ver·ance

/ˌpɜrsəˈvɪərəns/

Pays Off

noun:

steadfastness in doing something despite difficulty or delay in achieving success.

synonyms: persistence, tenacity, determination, staying power, indefatigability, steadfastness, purposefulness;

Fulton, Alabama, Implements Alternative Wastewater Systems



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When it came to solving the problem of failing septic systems and soil that wouldn't percolate, residents of Fulton, Alabama, were in a bit of a jam. High groundwater levels are prevalent for eight to 10 months of the year—especially in the low-lying areas along Bassett Creek, which carries water through Fulton and then south toward the Gulf of Mexico—and septic system failures were rampant. Frustrated residents of this town of almost 400 had even resorted to draining wastewater from their homes straight into nearby ditches. Behind the Post Office, untreated sewage flowed into the creek.

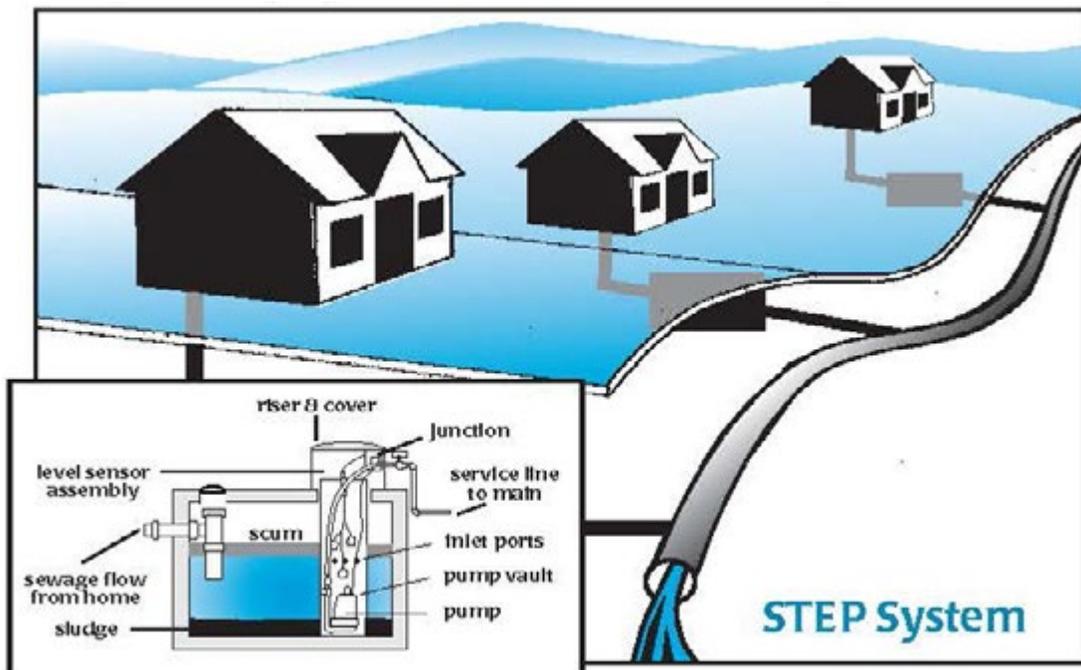
But Mike Norris knew it didn't have to be that way. A life-long resident of Fulton, Norris had served on the city council for 12 years prior to becoming mayor in 1998. With a background in water treatment, he knew there had to be better options for his town, so he began to research the possibilities. As he puts it, "When you're a small town without a lot of personnel, you just have to take care of things on your own."

A Quest for Information and Funding

During this period of research, Norris was introduced to Dr. Kevin White, professor and chairman of the Department of Civil Engineering at the University of South Alabama in Mobile, 90 miles south of Fulton. Dr. White is an authority on the subject of decentralized and small community wastewater treatment, and he put Norris in touch with Dauphin Environmental Equipment, a company that has worked on these types of systems for South Alabama Utilities (SAU).

Dauphin arranged for Norris to tour some of the decentralized wastewater treatment plants that SAU operates in several locations in Mobile. The utility installed and maintains more than 60 miles of interconnected effluent sewers serving 47 subdivisions, with secondary treatment by approximately 150 treatment units clustered at various sites. This type of wastewater treatment is known as a STEP [Septic Tank Effluent Pumping] system (see illustration below).

Knowing that funding would be a major hurdle, and that financing a conventional gravity sewer plant was not an option in Fulton, Norris saw possibilities based on what he saw in





Residents of Fulton paid no fees for the on-lot portion of their effluent sewer, thanks to the diligence of their mayor in obtaining state and federal funding.

Mobile. The mayor was convinced that it would be quite feasible and cost-effective to install the two-inch and four-inch collection lines used with the STEP units. These small main lines are easily installed along streets and roads, and because they follow the contour of the ground, excavation costs are lower than for gravity sewers.

A STEP system such as this consists of a septic tank to pretreat the wastewater and a submersible, low-horsepower sump pump to push the wastewater through the system. All of the wastewater from each home or business (i.e., the water from sinks, baths, laundry, kitchen, and toilets) enters the septic tank from the conventional gravity sewer leaving the building. No special plumbing is required.

A STEP system such as this consists of a septic tank to pretreat the wastewater and a submersible, low-horsepower

In the septic tank, the wastewater settles into three layers. Greases and floatable materials rise to the top, solid materials settle to the bottom, and partially clarified liquid remains in the middle. The wastewater in the middle layer will eventually be pumped into the pressure sewers.

Once he had decided on a STEP system as the solution to Fulton's wastewater crisis, Norris armed himself with photos of the city's dire situation and began his quest for funding. After discussions with a variety of state and federal officials, and ultimately making



Although Fulton's five AX-MAX™ units are situated partially above-ground, they can also be installed in-ground, as well as individually or in multi-tank arrays.

several trips to Washington, D.C., Norris obtained a combination of grants and loans from the U.S. Department of Agriculture's Rural Development, the U.S. Department of Housing and Development's Community Development Block Grant program, and the State of Alabama. These loans and grants allowed Fulton to provide wastewater service for all residents plus 30 customers outside of city limits.

Persistent Effort Pays Off

In 2006, the first phase of the project was completed on the west side of town. Phase I, which cost \$2 million to implement, comprises 65 on-lot STEP packages with service lines connecting to nine treatment units. In 2013, Fulton's Phase II plant was completed on the east side of town, consisting of 132 STEP connections and five larger treatment units at a cost of \$3.5 million. Both treatment plants have plenty of extra capacity, should the city need it.



As part of his research into treatment systems, Mayor Norris visited South Alabama Utilities, which has 60 miles of effluent sewers and dozens of textile treatment units.

According to Mayor Norris, "The system is doing what it's supposed to do, our property owners are satisfied, and the city council is tickled to death." All homes and businesses in Fulton, including the large lumber mill that is the city's major employer, are now serviced by the system. Others in the surrounding area are taking note of activities in Fulton. During the Phase II construction, several groups toured the site to determine if it was a model they could adopt for their own wastewater needs.

Enjoying the Results

In addition to serving as mayor, Norris also acts as the city's full-time wastewater plant operator. He continues to be impressed with the low cost of operations and maintenance for his two facilities. "Right now," he says, "the monthly sampling cost is our most expensive item." (Sampling is a standard requirement for the wastewater systems permitted by the Alabama Department of Environmental Management.)

Residents are also enjoying the benefits of this low-maintenance wastewater system, paying just \$37.50 per month for services. Another major benefit of the city's



This fiberglass shelter houses Fulton's ultra-violet disinfection units.

wastewater system has been the elimination of foul odors that used to linger in the air around town due to improper sewage disposal.

For his work, Mayor Norris was recognized in 2006 as a "Rural All-Star" by the Alabama Department of Agriculture and Industries "because of his untiring efforts to improve the community and improve the quality of life and economic opportunity for all [Alabama] citizens."

It took 13 years for Norris to see his quest to provide wastewater services to his constituents come to fruition. Looking back, he feels it was definitely worth all the time and effort, because "if we don't have sewer, we can't expect anyone to live here."

Author Bio

Darren Paschke is a community systems project manager with Orenco Systems, Inc. Most of the equipment used in the Fulton project was from Orenco. Contact at dpaschke@orencocom, or 800-348-9843, x233. Learn more about Orenco's products and services at www.orencocom.

More Information

The National Environmental Services Center's newsletter Pipeline covered STEP systems in the following issue: www.nesc.wvu.edu/pdf/WW/publications/pipeline/PL_FA96.pdf

Pipeline
Small Community Wastewater Issues Explained to the Public

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Alternative Sewers: A Good Option for Many Communities

If you are fortunate enough to own a home in a small or rural community, you probably appreciate certain aspects of country living. Being close to nature and far from the noise and complications of life in the city are among the popular reasons for choosing a home in a rural area. Although the advantages are many, rural life isn't always simpler than big city life. One example is the problem of how to best collect, treat, and dispose of wastewater from all the homes and businesses located in different parts of the community. A variety of factors help determine which wastewater technologies are best suited for a particular home or area. Often, communities will use a combination of different approaches for different circumstances to save money, control development, and protect public health and the environment. For example, in densely populated areas, like the main business section of town, a community may find that a conventional gravity sewer system (like those used in large towns and cities) and a centralized wastewater treatment plant is the most cost-effective and environmentally-sound way to collect, transport, and treat the wastewater. In more sparsely populated areas, where lot sizes are large and homes are spaced widely apart, onsite wastewater treatment with subsurface discharge may be more practical and cost-effective.

Alternative Sewer Option

But what about homes in locations that don't fit either of the above descriptions? And what about areas where onsite treatment can't be used? Many small towns have clusters of homes and housing developments located far from other populated areas of the community. Groups of homes may be located in low-lying areas near water, or in areas with a high water table or with rugged, rocky, or hilly terrain. Often, hookups to conventional sewers are not available in these places and would be too

Advantages and Disadvantages

One of the best features of alternative sewer systems is that they use plastic pipes much smaller in diameter than conventional sewer pipes to collect and transport the wastewater to final treatment. This is possible because the wastewater that goes into alternative sewers always first receives treatment of some kind (in a septic tank or grinder pump, for example) so that any large, solid materials are separated out or ground into smaller pieces. These small-diameter plastic pipes are less expensive and easier to install than conventional sewer pipes, which saves money for both the community and the individual homeowner. This is especially significant considering that collection system construction is often responsible for as much as two-thirds of the total wastewater treatment project costs. Another advantage of alternative sewers is that the construction of the lines and other design factors makes it less likely for wastewater to seep out or for other water to infiltrate the system. Extra water coming through cracked pipes and leaky

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National Small Flows Clearinghouse 1-800-624-8301



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Website: <http://www.nesc.wvu.edu>
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