

building better

By Brian Borders

The devastation and destruction caused by Hurricane Katrina in 2005 has forever impacted the Gulf Coast. Katrina was what one might call a generational impact event.

For an entire generation of people living in the Gulf Coast Region of the U.S., this single event has altered and shaped the course of their lives and futures.

Hurricane Katrina brings rise to two large decentralized wastewater plants

When visiting the region, invariably the name “Katrina” works its way into almost every conversation. The devastation and subsequent rebuilding has led to a shift in ideology from “building back” to how to “build better” to reduce the impact of a similar storm in the future. Wastewater infrastructure design and construction have been changed fundamentally thanks to the lessons of Katrina.

Among the hardest-hit areas were the coastal counties of Mississippi. As recovery and rebuilding began to occur, planning for infrastructure improvements also began to take shape. One way to reduce the impact associated with these storms is to reduce the number of people in high-risk locations by encouraging development away from the coast. Encouraging growth and development away from the coastline, however, is not an easy proposition. Establishing water and wastewater infrastructure north of Interstate 10 became a goal to provide a huge incentive for future development away from the Gulf of Mexico.

Post-Storm Wastewater Projects

The Jackson County Utility Authority initiated the development of decentralized wastewater infrastructure in Big Point and Wade, Miss. These communities are located approximately 15 to 20 miles from the coast. Neel-Schaffer Eng. was selected as the design engineer for the projects. The design engineer selected a fixed-film media filter to provide advanced wastewater treatment with drip irrigation as the technology to disperse the treated wastewater back into the environment.

Wastewater from current and future developments will make its way to the two treatment and disposal plants through the use of STEP collection and small-diameter pressure sewers. These two treatment facilities combined will have the capability of treating up to 220,000 gal per day. Upon completion and start-up, the systems will be the two largest decentralized fixed-film media filters in the U.S.

Quanics, Inc. was selected to provide the fixed-film media filters and drip irrigation equipment and also to provide engineering assistance. Quanics selected its proprietary AeroCell system for treatment and utilized Geoflow drip irrigation equipment for final dispersal. The AeroCell system is a pre-engineered synthetic media filter utilizing open-cell foam cubes housed inside individual fiberglass enclosures.

Wastewater treatment using open-cell foam is unique in that it is very absorptive, highly porous media with a large surface area per unit volume, which allows effluent and air to flow freely through it at the same time. These features prevent the foam from becoming clogged over extended periods of time.

Treatment occurs when the effluent is sprayed over the foam, where it slowly percolates downward. As the effluent passes around and through the open-cell foam media, it contacts large populations of aerobic

organisms and degradation of the wastewater strength occurs. Additional treatment occurs when the effluent is recirculated back through the system.

Effluent from the served structures will be pumped via STEP collection to a flow splitter that will divide the flow evenly between banks of recirculation tanks. The 40,000-gal fiberglass tanks by Containment Solutions are buried below the AeroCell treatment modules, further shrinking the system footprint.

Each recirculation tank is equipped with three separate duplex pump systems. Each pump system doses effluent to a dedicated bank of nine AeroCell treatment modules. The treated effluent then flows via gravity to recirculation devices that split the flow at a 4:1 ratio (80% recirculation). Recirculation of the treated effluent is critical to achieving reduction in wastewater constituents in that a parcel of water, on average, will pass through the media filter four times before leaving this step of the treatment train.

The proprietary recirculation devices split that flow, sending 80% back into the recirculation tanks and discharging the other 20% to another 40,000-gal fiberglass dosing tank. Multiple pumps in the dosing tanks time-dose the effluent through two separate ultraviolet disinfection systems and then onto large multi-zone drip irrigation fields for final dispersal below the ground. The entire system is controlled through the use of a custom-built control panel manufactured by SJE-Rhombus. A Mission telemetry system is connected to the controller to provide remote monitoring.

Hemphill Construction was selected as the general contractor for the project and began construction of the system in the fall of 2009. While new to the installation of this type of system, Hemphill quickly demonstrated that it was up to the task. The installation has gone smoothly. Quanics’ Gulf Coast representative J.H Wright and Associates provided design oversight and installation assistance throughout the course of the project. Currently, the system installation is ahead of schedule for completion by early Summer 2010.

Rebuilding a Region

After years of planning, discussion and review, the goal of providing wastewater infrastructure to existing homes and future development rapidly is becoming a reality. It has taken the efforts of many to bring this infrastructure to an area in need. As the rebuilding of the region continues, the current and future residents of Jackson County can look at this new infrastructure as a positive impact that Katrina ultimately had on their lives. **www**

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The AeroCell system is a pre-engineered synthetic media filter utilizing open-cell foam cubes housed inside individual fiberglass enclosures. Open-cell foam has been proven over the past 15 years to treat wastewater to secondary or better levels.

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