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Post-Katrina, an All-Terrain Sewer™ Revitalizes a Mississippi Town

Part 1 of 2

By Joseph Harmes

The eye of Hurricane Katrina made its final landfall in August 2005, along Mississippi's Hancock County (bordered by the Gulf of Mexico and Louisiana), crossed Interstate 10 and headed a few miles north to Kiln—an hour's drive northeast of New Orleans—where it proved equal opportunity in its destruction, ravaging the property and livelihoods of rich and poor, from unknown citizens to one of pro football's most iconic names—Hall of Fame quarterback Brett Favre.

STARING DOWN THE STORM

Out on Irving Favre Road—named after Brett's late father—his mother and relatives had decided to ride out the storm at the family compound where they had done so during another legendary weather event, Hurricane Camille, which in 1969 leveled Gulfport and Biloxi (Hancock is part of its three-county metropolitan area). While the house—built in 1950—survived that assault, Katrina's sustained 120 mph wind and record 6- to 12-mile storm surge destroyed Brett's childhood home.

In the immediate aftermath of "The Storm" (Katrina's victims remain seemingly reluctant to call it by name), few could prophesize anything positive in its wake. Half of Kiln (population 2,250) was under water and its town offices operated

out of FEMA trailers. While many across the affected region continue to fight to this day for compensation from their private insurance companies, every U.S. taxpayer would play a role in its recovery effort.



Use of a power auger is an efficient, clean, low impact method for installing E/One grinder pump tanks in the ground—site conditions permitting (photo credit: Compton Engineering, Inc.).

The historically cash-strapped region struggled in the best of times and it's doubtful much of it could have recovered from Katrina barring outside help. Western Hancock County, home to the John C. Stennis Space Center—NASA's largest rocket engine test facility—would continue to prosper after repairs. Travelers lured away from I-10 by Favre's Green Bay Packers legacy, however, would never contribute enough to bankroll Kiln's rebuilding efforts.

"The Kiln" (as it is always referred to locally, the "n" silent) was named for the once plentiful charcoal kilns in the area when great lumber mills provided steady employment. As they disappeared, some residents turned moonshiners. Al Capone reportedly sourced liquor there during Prohibition and legend says it was even marketed in Chicago as "Kiln Lightning." Today, it's also the home of one of Mississippi's largest equine centers where "Lightning" might be the name of a race or show horse it breeds and trains.

A BIG OL' GUMBO OF UTILITY SYSTEMS

To boost the area's standard of living and economic opportunities, the Mississippi Gulf Region Water and Wastewater Plan was laid out in 1999 to develop a regional infrastructure "backbone." But most of the available money to the Gulf Region's six counties was allocated to the stretch between I-10 and the Gulf of Mexico, a patchwork quilt of about 185 different service providers and over 85,000 individual on-site sewage systems handling wastewater from approximately 195,000 housing units. Towns like the Kiln were included but not deemed a priority.

Katrina changed that. A year after The Storm, state leaders decided to implement the plan in full. It recommended over \$600 million to fund water and wastewater projects in five counties, Hancock among them, to support existing and future growth patterns—particularly new post-Katrina house construction; economic

development; and, emphasizing a regional concept for infrastructure management.

"Within a year after Katrina, as part of (Gov. Haley Barber's) recovery efforts, the Gulf Coast Utility Authority was created," says Geoffrey

F. Clemens, P.E. and president of Compton Engineering, Inc. in Bay St. Louis, Mississippi. "The focus was not only to be on fixing and protecting what existed but also identify utility projects to mesh with the recovery and growth plan for the region."

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A high flood grinder pump station, rated for up to 15 feet of flood over cover, protects the integrity of the grinder pump system in flood prone areas (photo credit: Compton Engineering, Inc.)

The master plan for Hancock County identified projects to be constructed over roughly a five-to-ten-year time frame.

"In total, Hancock County alone had well over \$120 million in water and sewer improvements allotted," says Clemens. "The specific sewer project for the Kiln was readily identified as a priority project ... It was ultimately funded with over \$20 million to include the sewer collection and transmission as well as a treatment plant" to be funded through federal appropriations of disaster relief money distributed through HUD and the Community Development Block Grant program to the Mississippi Department of Environmental Quality.

AN ECOSYSTEM UNDER SEPTIC SIEGE

"The Kiln Utility and Fire District has never had any sewer collection systems or even a treatment plant to send it to," says David Pitalo, executive director of the Hancock County Utility Authority who, over 9½ years, has overseen \$142 million worth of projects that the entity received from the Mississippi Gulf Region Water & Wastewater Plan of 2006. "With the

funding from the Gulf Region Plan, we were able to build a new wastewater treatment plant and a sewer collection system. Also, factored in is future growth of the area," Pitalo adds.

"[The new plan] fit into the previous mandate. We took many houses off of septic tanks that drained directly into rivers, streams, and then eventually the Bay of St. Louis," says Pitalo. "The overall objective is to clean up all waterways in Hancock County and this was a significant benefit to that objective. We had many aging and failing septic systems and our objective was to take these offline, clean them out and fill them in. Doing this would keep all of the leaking septic tanks from getting into our waterways."

Kiln's deteriorating septic systems are far from unique. Approximately 25 percent of North America's homes rely on septic tanks—including suburbs and small towns as well as rural areas—and hundreds, if not thousands, fail daily, creating health hazards and the potential to deliver fecal coliform bacteria to surface waters.

A LOOK AHEAD

In next month's conclusion, we'll walk



Small diameter flexible pipe being installed alongside roadway with minimum environmental disruption (photo credit: Compton Engineering, Inc.).

through how the implementation of E/One's All-Terrain Sewer™ (ATS) low pressure system offers a simple, effective, and inexpensive solution for not only the Kiln but also comprises the largest installed base of pressure sewers in the world, serving more than one million end-users daily. ♦

Low-pressure, gravity-independent, contour-following sewage collection systems were pioneered by Environment One. E/One Sewer® systems have proven to be an economical and effective method of sewerage otherwise difficult land areas, such as flat, wet, rocky, and hilly terrain. E/One's Sewer Systems business is ISO 9001:2008 certified. For more information, visit www.eone.com.

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Post-Katrina, an All-Terrain Sewer™ Revitalizes a Mississippi Town

Part 2 of 2

See Part 1 on modernpumpingtoday.com

By Joseph Harmes

In part 1 of this series, we detailed some of the lingering damage left in the wake of Hurricane Katrina throughout the septic system of Kiln, Mississippi—just an hour outside of New Orleans. However, Kiln's deteriorating septic systems are far from unique. Approximately 25 percent of North America's homes rely on septic tanks—including suburbs and small towns as well as rural areas—and hundreds, if not thousands, fail daily, creating health hazards and the potential to deliver fecal coliform bacteria to surface waters.

In this month's conclusion, we'll walk through how the implementation of E/One's All-Terrain Sewer™ (ATS) low pressure system offers a simple, effective, and inexpensive solution for not only the Kiln but also for septic systems worldwide.

WHEN OTHER SEWER SYSTEMS ARE NOT PRACTICAL

The problem got so bad south of I-10 in Hancock County that the Mississippi State Department of Health prohibited the approval of septic tanks in that area, partially because the soil structure is not conducive to septic

tank use. One state report published in 1998 stated "a (septic tank) failure rate of 80-percent was assumed."

Although funding was not an issue for the Kiln Wastewater Collection System S-6, the project faced other challenges.

Clemens, who was Compton's project engineer for the new system, says, "The biggest challenge with Kiln was the relatively sparse population distribution within a broad geographic area. The area to be serviced was over 25-square-miles with only



Pressure sewers use small-diameter pipelines, minimizing environmental disruption.

approximately 1,000 customers spread across it. The typical distance between residences is significant," he says.

"Additionally, the region has a mix of terrain including low-lying, flat areas along the Jourdan River, low wetland type areas, as well as areas of significant topography with elevations of 50 feet mean sea level (msl) dropping to as low as 5 feet msl," Clemens says. "There were also several significant water bodies to cross as well as major state highways that could not be open cut. The geographic and physical challenges encountered typically lend an area to a pressure system rather than a gravity system."

"In the end, the low-pressure won out on cost feasibility over the gravity system and the vacuum system had too many geographic and topographic issues to overcome," says



Top view of E/One grinder pump station.





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Clemens. "The STEP system was a relatively competitive concept, but the region was also in need of a centralized wastewater treatment plant. With the cost of a major treatment plant as a given, the STEP system was not as economically feasible."

"Cost feasibility studies were done by the design team (which) consistently showed a gravity system to be financially infeasible when compared to a centralized, low-pressure grinder system," says Clemens. "A centralized vacuum system was considered as well. The pricing of the vacuum system was competitive with the grinder pressure system; however, the topographical challenges to a vacuum system as well as the broad area of low density service ultimately favored a low pressure grinder system."

A CATEGORY FIVE SOLUTION

Environment One Corporation emerged the winner of a public bid process. In 1971, the Niskayuna, N.Y.-



Small pressure sewer mains require only small trenches during installation.

based manufacturer pioneered the implementation of All-Terrain Sewer™ (ATS) low pressure systems and today its simple, effective and inexpensive solution comprises the largest installed base of pressure sewers in the world, serving more than one million end-users daily.

The heart of E/One's ATS begins with a tank about the size of a dishwasher that is buried in the ground, often in the same footprint of a decommissioned septic system. Interior components include a one-horsepower semi-positive pump that grinds waste into fine slurry. Its robust torque can propel the liquid through the inflow-and-infiltration-free pressurized 2-to-4 inch pipe for a distance of more than two miles—even uphill—to a force main or treatment plant.

Clemens says his first project exposure to E/One's ALL-TERRAIN SEWER came in 1995 at the Port of Pascagoula. "The Kiln project ultimately used E/One grinder pumps because

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collectively the design team and ultimately the contractor selected relied on the E/One pump's ability to ensure the project would work as designed," says Clemens.

According to one Compton Engineering study, the sewer collection system totals approximately 216,480 linear feet of force main consisting of PVC, C 900 and HDPE pipe in sizes up to 12-inches in diameter and includes bores under rivers, bayous, gas pipelines and state and county roads.

"The broad area to be sewerred only had to have four major pump stations (consisting of a buried pre-cast concrete wet well, with either two or three variable speed, submersible pumps and controls) with everything in between directly connected to the E/One pumps and a small diameter force main system. The project's design—which needed a pump system with the ability to meet extreme and changing heads conditions—fell within E/One's wheelhouse."



Grinder pump station installation.



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Additionally, says Clemens, "The option of (E/One's) flood-proof chambers and the simple pump exchange process in the stations were attractive. The ability to pump against a broad range as well as extremely high head conditions made the pumps desirable in a lot of applications."

The local district owns and maintains the residential customers' pumps. While the district is certified to do its own repairs (E/One's record surpasses its estimated eight—to-10-year mean time between service calls, including no preventative maintenance), it also utilizes E/One's Mississippi distributor, Magnolia Pump.

The \$13.7 million project (not including the treatment plant) today replaces septic tanks and privies with E/One grinder pump stations (simplex, duplex and triplex) installed along the right-of-way or near almost 900 homes and 30 businesses. "Based on the final costs it worked out to

around \$13,000-\$16,000 per customer of capital expenditure," Clemens estimates.

LAISSEZ LES BONS TEMPS ROULER!

One immediate effect is water quality. Pitalo says, "[Our rivers are] definitely being cleaned up by the new system. The majority of homes in and around waterways that lead to the Bay of St. Louis have been connected therefore minimizing any opportunities of damaging waterways."

Equally important, the installation of an ALL-TERRAIN SEWER is contributing to Kiln's economic development.

"The presence of this system has opened the entire area up to additional housing opportunities as well as industry," observes Clemens. "The absence of a sewer system all but stifled commercial growth and severely hindered residential development, especially in waterfront

areas. The presence of this system has already led to the initiation of high-end waterfront residential developments and business development around the airport and within the Kiln. The local McLeod Park also has been able to provide sewer services within the park, making it a viable economic tool in the county presently receiving thousands of overnight visitors per year." ♦

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