

Best Practice: New look for Conroe's Wastewater Treatment Plant, a new outlook on mitigation

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AUSTIN, Texas – Conroe's Wastewater Treatment Plant, built in 1972, serves Conroe and part of Willis, or about 90,000 residents of Montgomery County Texas. It's one of the fastest growing counties in the U.S. and lies 40 miles north of Houston. Storm mitigation, population growth and plant modernization rank as important factors in planning long- and short-term operations of the plant.

To accommodate population growth and to modernize operations, the Conroe Wastewater Treatment Plant has undergone two major expansions and upgrades since it was built. Mitigation efforts from the very beginning included a 10-foot levee surrounding the perimeter of plant operations and buildings.

"It's a 12 million-gallons-per-day-complete-mix-sludge plant," said Greg Hall, Jr. superintendent of the wastewater treatment plant. In layman's terms this refers to how sewage is treated in outdoor aeration basins before it's released as effluent into the nearby west fork of the San Jacinto River; at that time in the process the water is safe for the environment.

Hall, who has been with the plant over 18 years and has served as its superintendent for the past five, said flooding in 1994 prompted increased mitigation measures. A four-day rain event in October that year dropped 20-30 inches throughout Montgomery County. A section of the levee surrounding the wastewater treatment plant, which lies about 150 yards from the San Jacinto River, was breached.

"The breached section was reinforced with 6 inches of concrete and rebar," said Hall. The levee was expected to withstand another severe rain or storm event. It served well through several events.



A \$14,000,000 remodel of the WWTP in 2014 gave the facility the latest in technology to improve operations and cut energy costs. “We brought the plant up to 21st-century technology standards,” said Hall.

The plant was tested again the next year, before the 2014 remodel was completed. The 2015 Memorial Day flood dumped 10-11 inches of rain in 10 hours in Houston and surrounding areas. The heavy rains prompted the San Jacinto River Authority to release water from man-made Lake Conroe into its watershed of creeks, bayous and river forks — about 12,000 cubic feet per second — but Conroe’s Wastewater Treatment Plant made it through with no major problems. As a precaution, the plant’s staff of 11 at the time remained working there for two and a half days.

What area residents and media refer to as the “Tax Day Floods” of 2016 brought as much as 16 inches of rain to Montgomery County. The SJRA released a record 33,000 CFS of water from Lake Conroe. Conroe’s Wastewater Treatment crew remained at work four days as water inundated roads around and into the plant’s grounds. But the reinforced levee withstood the encroaching water. Operations continued successfully.

And then came Hurricane Harvey, Aug. 25, 2017. It broke lots of records. The storm dropped 48 inches of water over three days in the Houston area and in Montgomery County.

“The Lake Conroe watershed received about 130,000 CFS of water during the peak of the storm,” said Hall. “And Lake Conroe set a new release record of 79,000 CFS.”

Hall said the floodwaters arrived at the WWTP Aug. 27. By 3:30 a.m. Aug. 28, a decision was made to evacuate the crew by boat, except for four, including Hall. Later that morning, a Black Hawk helicopter was called in to rescue the remaining four. 5 feet of water completely inundated the facility and its offices. The wastewater treatment plant was inoperable; its equipment was nearly a total loss.

Remarkably, and to high acclaim including a national award, Hall’s crew, along with a few staffers from the city’s public works department, got the wastewater treatment plant back online Sept. 3. They did it with new and rented equipment but most of all, through solid teamwork and Hall’s leadership. During the recovery,



they made up for a temporary loss of automation by working a staggered 24/7 schedule for the next six months.

According to Hall, repairs to the WWTP after Harvey cost the city of Conroe about \$9.5 million. Some additional money may come from a capital projects fund and a grant from the Federal Emergency Management Agency.

“Harvey opened the door to additional modifications in operations to improve efficiencies,” Hall said. “But we also have [significant] mitigation projects completed or underway.”

Elevation of the offices, once at ground level, is completed and more changes will come with additional mitigation projects. The levee and retaining wall will be raised 3 feet to the top elevation of the aeration basins, instrumental in the conversion of sewage to its environment-friendly effluent stage. Equipment, including critical electrical gears, will be elevated.

More rain troubles came to South Texas and to Montgomery County with Tropical Storm Imelda in September 2019. Pockets of flooding affected families in some areas, but rain was minimal near Conroe’s Wastewater Treatment Plant, leaving more time to complete planned post-Harvey mitigation projects.

Perhaps the most important Harvey takeaway: a new respect for the surprises Mother Nature can generate and a new outlook on mitigation, an ongoing activity. Hall would also underscore the value of the topnotch teamwork that helped restore the plant’s critical role in getting the city of Conroe back on its feet in 2017.

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