

Products In Action

Tanks, linings & coatings

Wastewater Impoundment Converted To Process Tank At Georgia Chemical Company

Fisher Tank Company of Chester, Pa., has placed a leakproof steel liner into a 260-ft.-diameter, 14-ft.-deep wastewater treatment facility at the caprolactam production plant of DSM Chemicals North America, Inc., near Augusta, Georgia.

Fisher converted this formerly unused wastewater impoundment into a tank, avoiding the much greater expense of building an actual aboveground tank. The company completed the top-priority job, which included welding together heavy steel plates, in ten days.

DSM desperately needed the in-ground facility to augment two aboveground three-million-gallon tanks which aerated wastewater from the process which produces the caprolactam, which is a substance which goes into Nylon 6 fiber for carpets and engineering plastics. Aeration uses bacteria in the presence of oxygen to break down organic material in the water.

This chemical company has operated the processing site since the 1960s, expanding it greatly in the mid-1970s and adding two polymerization plants in the 1990s for making the Nylon 6. Then it built a new facility for recycling caprolactam from used carpet. This facility was scheduled to come on-line in April of 2000, but DSM found that the state-of-the-art wastewater treatment plant which it had installed in 1990 did not have sufficient capacity to handle this additional load.

"Aeration is the final step in removing organic waste from the water before we discharge clean water into the Savannah River," said Reese Bridges, maintenance manager for Augusta Service Co., DSM's service organization. "We needed to increase our treatment capacity very fast because we didn't want to block the recycling operation. We made a decision to recommission the earthen impoundment which had been part of the old treatment system, converting it so that it would actually function as a tank."

The 260-ft.-diam. excavation was already there and included a polyethylene liner overlaid with gunite about 1-in. thick. "We figured that it would be much more cost-effective, saving perhaps as much as \$1 million, to use the existing impoundment rather than build a new tank above the ground," Bridges said. "All we had to do was put another liner in it. Building an aboveground tank with straight sidewalls and thicker seals would have been impractical, costing at least twice as much."

Dan Skedsvold, DSM Chemicals' senior environment specialist, said DSM also considered the option of placing another plastic liner on top of the gunite. "The plastic would have cost about 75 percent as much as a steel liner, but we felt more comfortable with steel because of its reliability," he said.

DSM, which employs about 600 people at the site, including the service company maintenance force, advertised for bids on the steel liner in



Installation at the caprolactam production plant of DSM Chemicals North America, Inc., near Augusta, Georgia.

The liner, welded in place on top of the former gunite, had to be 100 percent steel in order to be leakproof.

March of 2000. Fisher, which had earned a very positive reputation at DSM from having successfully installed six tanks at the plant in the last ten years, was low bidder among several competing tank companies.

After being awarded a \$500,000 contract at the end of March, Fisher worked around the clock, ten people on each of two 10-hour shifts, to meet DSM's very tight schedule. Fisher finished the job early in April of 2000.

The liner, welded in place on top of the gunite, had to be 100 percent steel in order to be leakproof. Fisher personnel, employing only continuous welding, joined 20-ft.-wide steel plates and vacuum tested each joint to make sure there were no pinhole leaks. The gunite, with its poly liner, now functions as secondary containment, meeting the requirements of environmental regulations. In the unlikely event of a leak occurring, this secondary system would drain the water through the bottom. For additional protection, Fisher coated the entire liner with an anti-corrosion epoxy.

"It's unusual to employ a steel liner," Bridges said. "Most impoundments put in a plastic poly liner, and may or may not have gunite over that. Fisher personnel performed admirably. They completely met our schedule despite some tough moments when they had to work around delays from rain which dumped six inches of water in the bottom of the containment. We always felt very comfortable that Fisher would achieve the work in the required time and would give us a good reliable installation. They met all our expectations. We haven't had any leaks at all and no liner problems." The new facility has almost doubled DSM's treatment capacity.

"Fisher Tank really validated our decision to use the old impoundment," Skedsvold said "When we only used the two tanks, we had six million gallons of aeration capacity and needed more. Converting the impoundment increased this by 4.5-million gallons. The new facility, like the other two tanks, handles about 850,000 gallons of water each day. Wastewater has a residence time of only one day throughout the plant before we discharge it into the river, absolutely clean."

According to the company, the project saved DSM at least \$500,000.

For further information, contact Fisher Tank Company at 800-833-7049; fax 803-957-3376; visit www.fishertank.com.