

Coatings applicators from the Aulson Company apply a prime coat to one of two equalization tanks at a wastewater treatment plant in Merrimack, N. H.

# COATINGS PIONEERS

## WWTP PROJECT COVERS NEW GROUND ON ITS WAY TO SUCCESS

**M**ost of the residents of Merrimack, N.H., will never know the logistical complications that went into the coating phase of the ongoing upgrade to their wastewater treatment plant.

They'll just know that their plant, which has won national awards for its innovative operation from the EPA, is working effectively, and that's thanks to a new concrete coating system designed to protect concrete from hydrogen sulfide and low pH waste.

But for several months in 2006, the town's engineer, the coatings contractor and the coatings supplier were heading into previously unexplored territory, from a coatings perspective.

"Specifying special concrete coatings is challenging," says Chris Dwinal, PE. Dwinal is the project manager working for Wright-Pierce, a New England consulting/engineering firm contracted by Merrimack to write specifications for the project. "And we faced a few interesting challenges on this project."

### At A Glance


Challenged by a shrinking painting season and equalization tanks in greater need of concrete repair than they expected, owner, supplier, engineer and contractor teamed to apply Sherwin-Williams Sher Flex, a system that offers long-term protection as well as structural repair in a single application

## Unique plant

Things started simply enough. Built and put online in 1970, the plant treats an average of 3.23 million gallons of wastewater per day generated by the Town of Merrimack, named for the river that's carved a valley here in southern New Hampshire, and its 27,000 local residents and area businesses, the plant also treats the wastewater of the next-door, large-capacity major brewery, which makes this wastewater plant unique in its design and operation. The brewery's large volume of organic liquid byproduct has

necessitated two equalization tanks on the grounds.

Faced with a growing population in the area, a change in the waste stream characteristics from the brewery, odor issues from a trickling filter and outdated equipment on-site, the town embarked on a \$4.5 million Phase I upgrade. Among other improvements, the upgrade included the construction of a new primary clarifier to supplement the two existing clarifiers, and the refurbishment of three existing mixing tanks into septage equalization tanks.



**At left, an up-close look at the filling properties of SherFlex Elastomeric Polyurethane. At right, Chris Dwinal on site at the Merrimack (N.H.) Wastewater Treatment Plant.**



Working with Sherwin-Williams in developing a specification for the project, Wright-Pierce personnel were reluctant to specify an epoxy-mortar system for the new concrete due to its rigid characteristics. According to Dwinal, new concrete in particular tends to be particularly dynamic in its early years, especially in climates in which seasons bring varying weather patterns. A rigid coatings system, such as an epoxy-mortar system, won't move with its substrate and could eventually crack prematurely.

Sherwin-Williams representative Bob Cusack and corrosion specification specialist Scott DeVinney proposed an alternative, flexible elastomeric system for the primary clarifier launders and the mixing tanks. Meanwhile, Sherwin-Williams Cor-Cote SC Sewer-Cote was chosen for the equalization tanks.

The construction project was publicly bid and Penta Corporation of Moultonboro, N.H. submitted the lowest bid and entered into a contract with the town. Penta partnered with The Aulson Company, a specialty industrial coatings contractor from Methuen, Mass., to apply the coatings.

## Bug holes, degradation

Complications soon arose, however. When Aulson personnel, led by Gerry Rancourt and Tom White, began blasting away the existing coal tar finish on the equalization tanks, they revealed bug holes and generally more concrete degradation than anyone expected to find. As a result, application of a parge coat

and further grit blasting loomed as a necessity if they were to stick with the Cor-Cote SC specification. Further complicating matters was the oncoming fall and the promise of cooler weather.

The town and Wright-Pierce then agreed with Cusack and DeVinney that a switch to the system specified for the primary clarifier launders would be a good choice to finish the equalization tanks. But just days after all parties agreed to the switch, that product was no longer available.

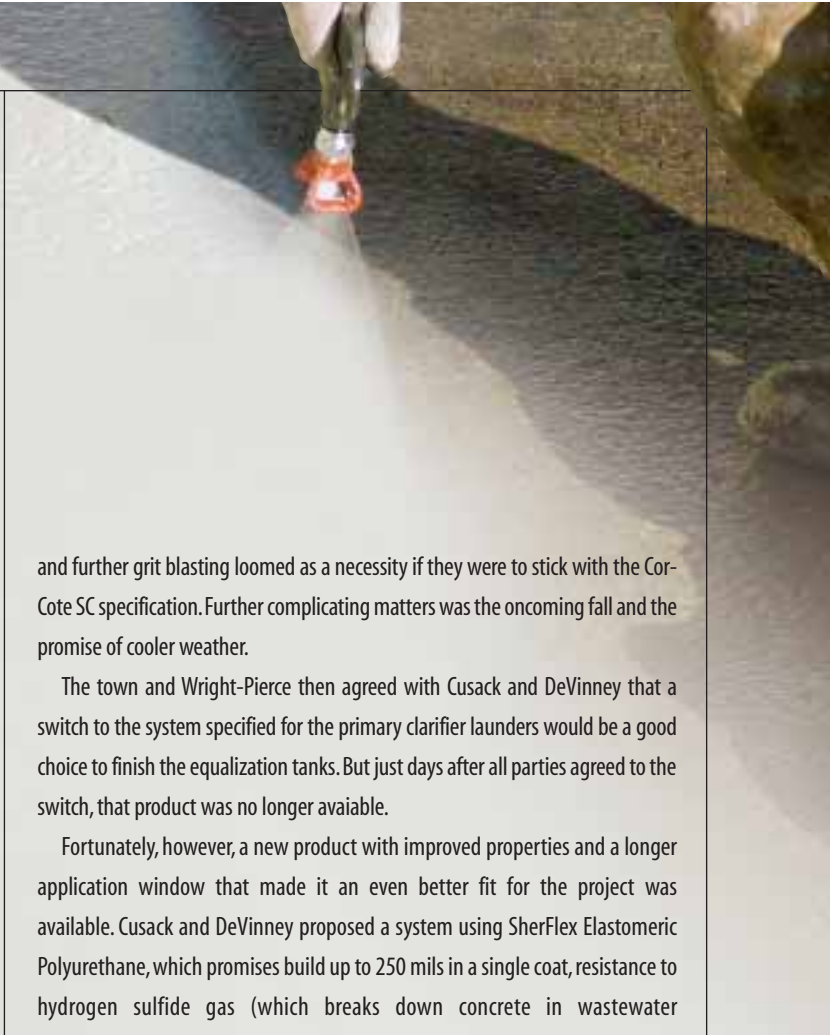
Fortunately, however, a new product with improved properties and a longer application window that made it an even better fit for the project was available. Cusack and DeVinney proposed a system using SherFlex Elastomeric Polyurethane, which promises build up to 250 mils in a single coat, resistance to hydrogen sulfide gas (which breaks down concrete in wastewater environments), concentrations to 50 parts per million, continuous exposure to wastewater with a pH as low as 3 and enough long-term flexibility to endure concrete movement.

Dwinal was concerned that the product hadn't been used yet, but the backing of a company with a 140-year legacy helped ease those fears.

"We said, 'OK, where have you used it?'" recalls Dwinal. "It turns out they hadn't yet. We had some concerns about using a new product, but we talked to the people doing the testing in their Chicago testing facility. And since the product hadn't been used in the field before, we asked Sherwin-Williams to extend the warranty for us, and they agreed."

"As specifying engineers, we rely heavily on the coatings manufacturer in situations like these. Obviously, the ultimate success of any coating comes down to its long-term performance. We've worked with Sherwin-Williams in the past and respect their knowledge."

The town and Wright-Pierce eventually agreed to use SherFlex, but by this time much of the 2006 painting season had slipped away. Fortunately, SherFlex can be applied to 20 degrees F, but it was mid-October when coating was finally set to begin, so a low-temperature tolerant primer was required. Corothane I Moisture Cure Urethane Primer, which can be applied to 20 degrees F, fit the bill perfectly.



## Tanks done

The equalization tanks, each of which measured about 11,000 square feet, were finished before the winter.

“With the weather we were chasing, it’s amazing we got it done,” says Rancourt. “The guys who should really get the credit are the ones who were in there freezing their fingers. But the SherFlex went on very well. Plus, it gave us more working time than other quick-set products we’ve used.”

Coatings are being applied to the rest of the concrete tanks and clarifiers on-site in the spring and summer of 2007

“We certainly felt like we did some pioneering on this one,” says Dwinal. “And we learned a few things along the way.”



**Gerry Rancourt of the Aulson Company and Bill Ouelette of Penta Construction discuss progress on the plant upgrade under way at the Merrimack (N.H.) Wastewater Treatment Plant. Below, one of the finished equalization tanks on the grounds.**