

Suwanee Creek Station, Georgia

Custom Design of a Two-Stage,
High-Head Solution

That's high head," says **Roger Toebben, P.E.**, about the 350 feet of total dynamic head handled by the Suwanee Creek Pumping Station, which has been up and running since January 2001. "There are a few sewage pumping stations like this, but they're not real common."

Very high static head and a long force main (42,500 feet) led to the notably elevated dynamic head, which meant that a two-stage station -- using two pumps back to back in the same line -- was an economical choice.

Brown and Caldwell prepared 100 percent plans and specifications for the custom-manufactured pumps and the station. The team considered submersible and dry pit pumps, as well as layouts with horizontal pumps, one motor driving two horizontal pumps, and vertical pumps with extended shafts. In the end, the team recommended a dry-pit design and three sets of variable-speed, non-clog, two-stage vertical pumps.

Pumping 12.2 mg per day, the new station lets Gwinnett County, Ga., divert flow from the Chattahoochee Basin to its new water reclamation facility

Flywheels provide surge protection for the station. "They're clean, they work really well, and they're low-maintenance," explains Toebben.

"When you lose electrical power in an outage and you're pumping, you have a real problem. We took a different approach to solving it. A motor not only powers the pump, it

turns the flywheel, which is a heavy steel disk. During an outage, the flywheel keeps turning and provides power to the pump to avoid a surge. Most other people use a tank that sewage flows back to, but it requires a lot of unpleasant cleaning."

For energy efficiency, variable-frequency drives (VFDs) were used to run the pumps. "The VFDs prevent constant cycling of the pumps, plus they further control surge," Toebben says.

Another operations-friendly feature is the self-cleaning, non-confined, ventilated wet well. "You can pump the well clean of all debris," says Toebben. "You don't appreciate it unless you're a worker who has to do that. For an owner it's a real benefit. Also, being fully ventilated, the wet well is classified as a nonconfined space, a great feature for worker safety."

Not only the safety, but also the knowledge and concerns of pumping station operators should be considered during design, believes Conrad Gelot, P.E., the director of engineering and construction for the county Department of Public Utilities. "The designers sought out and utilized input from the operations staff, and their practical experience is reflected in the design. That's a measure of how well it's operating."

Gelot was surprised at the smooth construction of the Suwanee Creek Station. "It's a deep excavation, and we expected a somewhat complex construction. But it was fairly trouble-free, a tribute to a good design and construction team."

