

# Streamlining for Success

By Barry Harms

*Founded in 1925, the Western Carolina Regional Sewer Authority (WCRSA) is a special-purpose district of South Carolina and located in the northwestern part of the state. The organization serves more than 400,000 customers in Greenville County and parts of Anderson, Spartanburg and Laurens counties, covering a total of 296 sq miles.*

A South Carolina sewer group builds its future around footprint-reducing pump technology

WCRSA maintains 300 miles of major sewer trunk lines and conducts operations through nine major wastewater treatment facilities located on three river basins: the Enoree, Reedy and Saluda rivers.

## Challenges

For more than eight decades, WCRSA has been committed to protecting the public health and providing the necessary infrastructure to support economic growth in the state, despite the tightening of state and federal environmental regulations. Celebrating 80 years of environmental stewardship, WCRSA's goals are to be a world-class organization and have zero violations, all while being dedicated to enhancing the quality of life in its service area by providing high-quality wastewater treatment services.

A population surge over the last 15 to 20 years, plus the age of one of the area's oldest pump stations, challenged WCRSA with the task of rebuilding the Tubbs Mountain Road No. 1 pump station. Originally installed in the 1960s, this particular pump station was operating at its maximum duty cycle and exhibiting telltale signs of aging.

Just prior to launching an overhaul for the pump station, WCRSA completed its participation in the U.S. Environmental Protection Agency's CMOM Program, whereby the Tubbs Mountain No. 1 site was identified as one of WCRSA's top five

repeat sewer system overflow (SSO) sites. As a result, WCRSA made a commitment to correct the problems associated with this SSO site within a two-year period, while maintaining operation of the site during the construction and rebuilding process so as to minimize the community's discomfort.

"This process is very difficult and can be very expensive," said Tony Walton, collection system manager for WCRSA.

According to Trent Bowles, pump station supervisor for WCRSA, "The one thing that makes this project specifically difficult is space. We're in a developed area, so we have a very small footprint that we have to work within. Currently, the site is very compact, but the redesign is putting even tighter restrictions on space. It's a challenge."

## Rebuilding Around State-of-the-Art

Rogers & Callcott, the planning firm charged with addressing the WCRSA challenge, originally drafted the new pump station design to incorporate two 7- by 10-ft Gorman-Rupp pump stations working within a larger footprint; however, as a new and smaller footprint was mandated, creativity was required to uncover new solutions.

According to Rogers & Callcott, the Tubbs Mountain Road No. 1 pump station was also limited in capacity by the facilities that receive its discharge. Therefore, the decision was made to reroute the force main to a remote destination approximately two miles away. This way WCRSA could discharge into a large gravity trunk sewer that would have no pumping facilities on it rather than build a force main to its original discharge point.

"The day that decision was made was a big day in western South Carolina," Bowles said. "This new pump station with the new design



View of a complete set of Ultra-V pumps from the belt drive side.  
Photos courtesy of Stephen Vitosky.

## APPLICATION SEWER AUTHORITY

has removed a load from a regional pump station, and that is an additional benefit to the sewer authority.”

Proceeding with the plan, the team determined the yield and the delivery conditions that would be needed to achieve its desired result. Because of the area served by the pumps, the station took into account a yield of 800 gal per minute to achieve a total dynamic head of 160 ft. A conventional, single pump was incapable of delivering this type of volume and pressure. The plan was drafted to incorporate two T-series pumps, operating in a series one right behind the other, in order to obtain the required head.

Midstream, however, Rogers & Callcott became aware of new pumping technology that could further maximize the new station's overall efficiency and performance, offering up to 30% more capacity than what the team was previously hoping to experience.

By using the new Gorman-Rupp Ultra V pump technology, WCRSA would be able to use the horsepower for future capacity and cut down on its size requirements for the onsite generator.

Being able to reduce the required footprint for WCRSA—while also freeing up space to allow for equipment to be better positioned for safer, more comfortable routine maintenance in the future—was also key in the decision making process.

“To integrate the new technology required a quick redirect and redesign, but we went to work, modifying drawings to accommodate the change in technology,” Walton said. “We felt as if the benefits of the site, the savings of this compact configuration and the fact that these pumps are really more suitable for what we were trying to do made it all worthwhile.”

WCRSA has agreed with the decision to use the new Ultra V, the first pump of its kind in South Carolina. “We aren't able to fully utilize the Ultra V initially for what it's designed to accomplish at peak performance,” said Walton. “However, it will give us more room, allowing us to get our equipment in and perform the work that we will have to perform to keep this station functioning for the next 20 to 30 to 40 years. That's a lot of return on investment.”

### The Consensus

“We never really had any concerns about the technology being new because of the reputation that Gorman-Rupp has and because of the past experiences we've had in working with their pumps,” Bowles said.

Rogers & Callcott concurred with the recommendation. “The advantages that this new technology has over older technology made it well worth any associated risks,” Bowles said. “We trust that any product put on the market by this company has been pretty well tested. If Gorman-Rupp is confident with the technology, so are we.”

### Gathering Data

A custom level controller was also adopted for this new application, integrating air-release valve technology into the solution. WCRSA utilizes a level control system into the pump's control panel. For communication requirements for that data, WCRSA relies on a RACO dialer, which is also used on all WCRSA pump stations for data monitoring.

“We also have an internal polling system,” Walton added. “We're presently using land lines at all our facilities and poll those stations twice per hour to ensure communications. If we don't get a signal, then we know we're experiencing a disruption on the system, and someone is instantly dispatched to the site to rectify the failure.”

To WCRSA, the ability to monitor the pump stations is extremely important, allowing the engineering team to focus time and attention on other items such as repairs and line work associated with the pump stations and the authority's collection system. With the new system, the authority can now diagnose problems whenever they occur by using gauge readings. To ready staff and personnel for this constant flow of information, all WCRSA personnel are exposed to ongoing, authority-sponsored training courses.

With maintenance a clear priority to WCRSA, the pump station crew is staffed with seven members, including a certified electrician and mechanic for each team. These teams are solely responsible for the inspection, operation and repair of approximately 21 pump stations on each of the three routes.

### Maintenance-Ready

The decision to install the new Ultra V self-priming centrifugal pump was also a cost-effective decision for the sewer authority. “Due



A Gorman-Rupp Ultra-V pump.

to the inventory of parts available to us within a 24-hour period, any problem that could arise could be quickly rectified with our own staff and simple maintenance in the field,” Walton said.

In all, the authority is responsible for nine different pump manufacturers throughout its comprehensive collection system. Of the authority's 63 pump stations, more than half are Gorman-Rupp.

To further ensure that repairs are streamlined, WCRSA maintains an inventory of critical spare parts in case a pump does have difficulty and to support its internal ability to rebuild all pumps. The authority also values the ability to use one universal rotating assembly and other spare parts for all like-series pumps being used within the system.

“We do have spare parts for the other manufacturers in the system, but by having a large number of Gorman-Rupp lift stations within our system, it's just more cost-effective to be able to maintain a streamlined spare parts inventory,” Walton said. “I've had downtimes of 13 to 14 weeks waiting on parts for other pump brands. If it's the wrong time of year ... you start sweating bullets.” **PS**

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