Membrane Filtration Results in Significant Cost Savings for State-of-the-Art Water Treatment Plant in Tennessee



The challenge

During the summer of 2007, Hendersonville Utility District's (HUD) 23-year-old water treatment plant, which drew water from the nearby Old Hickory Lake (a tributary of the Cumberland River), experienced a particularly severe drought that stressed the capabilities of the water treatment plant. In need of a long-term solution, HUD officials were tasked with deciding whether to expand the conventional treatment plant or design and build an entirely new water treatment plant—one that would increase output capacity and incorporate the latest advancements in treatment technologies.

The solution

The vision of HUD's general manager Tom Atchley and Board of Commissioners was to build a water treatment plant equipped to provide a plentiful, high-quality water supply for the town for generations to come. With this in mind, they ultimately decided to construct a brand-new, state-of-the-art water treatment plant technologically far superior to HUD's previous water treatment plant. Following a pilot phase, the Aria FLEX™ system outperformed competing systems through its impressive and accurately scaled results, robust membranes, and the professionalism of the Aria Filtra® team. Built to perform at a capacity of 10 million gallons per day (mgd), the plant currently utilizes a mere 45% of full capacity to serve the town's population of more than 51,000. Designed to accommodate Hendersonville's

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> *"From pilot to performance, [Aria Filtra] has provided superior technology, support, and customer service. [Aria Filtra] stood head and shoulders above other membrane systems we researched, and our top-of-the-line facility has set a precedent for treatment facilities for generations to come. Beyond [Aria Filtra's] membranes outperforming our expectations, we believe that a product is only as good as its people. The [Aria Filtra] team behind the membrane system has passion and dedication that have exceeded the already high bar that we had set for Pall*."*

John Wunner, water plant superintendent, Hendersonville Utility District

*Aria Filtra, formerly Pall Water, was a division of Pall Corporation when this quote was provided.

population growth and rising water demands for decades to come, Aria Filtra's system can increase its capacity to provide an additional 2 mgd of filtered water.

As the new water treatment plant turned on at the same time the old plant shut down, it was absolutely critical that operators were well-trained, confident, and equipped to run the Aria Filtra system. Making matters more complicated, operators were using a membrane system for the first time and needed to rid themselves of the conventional water treatment mindset. Key to the smooth transition was an extensive two-week training program that Aria Filtra technicians provided, both in the classroom and at the old water treatment plant, to ensure operators could confidently run the system independently from day one.

The results

The state-of-the-art facility received a 100% (approved) rating on the Sanitary Survey—"the gold standard" in municipal water treatment—conducted by the State of Tennessee Department of Environment and Conservation in April 2017. Facilities are judged on a variety of state requirements including quality of water, drinking water compliance, complaints, and more; for HUD, receiving a perfect score of 100 was extremely gratifying and a great honor that was aided by the reliability and performance of the Aria FLEX filtration system.

Since opening, the new Hendersonville water treatment plant has realized thousands of dollars in additional cost savings each month as the high recovery rates and quantity of wastewater produced by the membranes have reduced more than 70% of sludge waste compared to the amount the original plant produced. Savings have been so significant because sludge is costly to remove given it's charged by the gallon from the receiving wastewater treatment facility in Nashville, TN. Additionally, the superior performance of the membranes has also allowed the facility the luxury of periodically taking racks offline to conduct preventive maintenance.

This plant has become a model for future water treatment systems and is recognized on a national and international level. Water utility owners, operators, and engineering companies across the U.S. have toured the facility to take note of the system's quality and robust technology.

The benefits

The durability and performance of the Aria FLEX system and its membranes have allowed HUD's state-of-the-art facility to produce high-quality water that meets all regulations. Overall, the Aria FLEX system provides the following benefits:

- **Meets Tennessee's regulations surrounding water quality**
- **Delivers significant cost savings due to decrease in sludge water and chemical expenses**
- **Provides plentiful capacity and the ability to scale as demand grows**
- **Ensures a smooth transition to a membrane system through hands-on training and support**

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Aria Filtra, a division of Trojan Technologies, is the filtration partner of choice for municipal and industrial customers that need reliable access to consistent, high-quality water. With more than two billion gallons of installed capacity spanning six continents, Aria Filtra has the process expertise, proven technology, and intelligent systems that customers trust to reliably tackle their most complex water treatment challenges. Featuring industry-leading durability, reliability, and ease of operations, our broad portfolio of solutions ensures mission-critical functions continue to work as needed, day in, day out, for years to come. Learn more at AriaFiltra.com.

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