



Meeting New Drinking Water Regulations and Increased Capacity Needs with Robust Membranes

THE CHALLENGE

Sherbrooke, a township in eastern Quebec, was required to update its aging water treatment plant as its drum filters microstrainers system was unable to meet new drinking water regulations set by the Ministry of Environment. The plant, which serves 145,000 residents of Sherbrooke, uses source water from Memphremagog Lake. While the lake itself is protected and the water does not contain much organic matter, the plant's drum filters were unable to meet the new safety regulations because they were solely capable of filtering algae. For a solution, time was of the essence as the plant was required to complete construction within Quebec's stringent deadline in order to secure funding for the project.

THE SOLUTION

Eager to update its aging plant, the Sherbrooke team hired EXP, a regional engineering firm, to evaluate a variety of vacuum and pressure membrane filtration systems, as well as direct filtration systems, to determine the system best suited to meet the new Ministry of Environment drinking water regulations. The new regulations required Sherbrooke's water treatment plant to reduce turbidity by meeting limits of 0.2 NTU from the previous limits of 5.0 NTU thus requiring the plant to deploy a much more robust system to attain compliance.

Ultimately, Pall Water's Aria™ FLEX membrane system was selected following a successful pre-install bid selection and a nearly six-month pilot where it offered the best lifecycle costs and achieved the highest amount of water recovery, at 99.5%, compared to other systems.

Initially, the Sherbrooke team was anxious about investing in innovative membrane technology, which was

“From day one of the Pall Water pilot, the team at Sherbrooke's water treatment plant felt like a valued customer. While initially anxious about the prospect of implementing a new membrane technology - which no other cities were using in Quebec at the time - our operators were convinced within the first few days of the pilot due to how easy the system was to operate and the noticeable high quality of the water.”

Luc Larrivee, Commander in Chief for Water, Sherbrooke Water Treatment Plant

new at the time. However, the Pall team was very transparent, providing a hands-on pilot that quickly convinced the engineers to trust the technology upon seeing system results. Critical to the success of the pilot was Pall's local approach and active role. With technicians that spoke French, the local language, the Pall team was able to avoid any language barriers and explain to the operators how the system operated while helping them get comfortable running the system.

THE RESULTS

Beyond needing to meet the Ministry of Environment's 0.2 NTU limits, the system also was required to achieve 0.1 NTU 95% of the time and 0.2 NTU 100% of the time. Reducing Crypto and Giardia was another key element of this project as Pall provided 4 log reductions, beyond the 3 log reductions that were required of the city. With this reduction of solids, the robust Aria FLEX system has been able to reduce chlorination by 40%. In the winter months, Sherbrooke is able to actually stop re-chlorination in various places across its lengthy distribution channel as the colder temperatures limit the growth of bacteria. This reduction of solids has brought additional savings to the city as Sherbrooke's reservoirs and distribution system now require less cleaning. Tanks, which used to require cleaning every two years, now only need to be cleaned once every four to five years, while the cleaning required for the distribution system has been reduced by two months per year, freeing up the operators to perform more strategic tasks.

Not only was the Pall system able to meet drinking water standards and achieve compliance, but it was also able to exceed the plant's original capacity of 81,000 meters cubed per day (m³/d), which had reached its limit and was no longer able to meet Sherbrooke's growing, and future, capacity needs caused by population growth. Pall's Aria

FLEX membrane system is capable of producing 96,200 m³/d in present phase. Furthermore, the Aria FLEX system is poised to scale and equipped to handle a maximum capacity of 101,610 m³/d.

At the initial installation, Sherbrooke installed a secondary system as the water treatment plant was approaching its maximum capacity. Originally, Sherbrooke had wanted to expand its water treatment plant in the next 20 years however its plant was unable to manage the excess waste that was being produced. As the township didn't want to refurbish both of its plants at same time, it determined that deploying a recovery system was the best way to limit costs and restrict the volume of waste from the water plant. Pall engineers customized a backwash system that would generate less waste with a higher volume concentration that the water plant could attain. The backwash recovery system is part of the design and takes water at 95% recovery up to 99.5%.

THE BENEFITS

The robust membranes were able to easily meet the Ministry of Environment's new drinking water requirements for the Sherbrooke water treatment plant in addition to surpassing current and future capacity needs as the township's population continues to expand. Overall, the Aria FLEX system provided the following benefits:

- Ability to meet drinking water standards
- Reliable membranes capable of achieving the highest recovery rates
- Reduced solids enable monetary savings and efficiency
- Additional capacity to support future population growth
- Local customer service and technician support



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