CITY OF LEBANON WTP, UF FIBERFLEX™ SYSTEM

CASE STUDY

Portland, Oregon Water Treatment Plant had a crucial need for a flexible membrane UF system. FiberFlex™ answered.

APPLICATION: Municipal Drinking Water

CAPACITY: 17 034 m³/d (4.5 MGD)

LOCATION: Lebanon, Oregon, USA

COMMISSIONED: January 2019

CHALLENGE

The City of Lebanon, located 80 miles south of Portland, Oregon, required an upgrade to their existing water treatment facility by replacing its conventional system with membrane filtration. The retrofit required a compact footprint. Treated water quality requirements included a maximum turbidity of less than 0.1 NTU, 100% of the time, a minimum LRV score from daily Membrane Integrity Tests of 4.3 log for the membrane system, and virus removal of at least 0.5 log.

SOLUTION

After competing against 5 other membrane system suppliers, an extensive evaluation was conducted by Carollo Engineers and the Owner and H2O Innovation, using Toray's HFU-2020N modules, was selected.

A four (4)-train Ultrafiltration (UF) membrane system was designed as the preferred treatment process to maximum water recovery and reduce footprint. The modular aspect of the UF treatment trains also lend themselves perfectly to a staged and methodical construction process that allowed for minimal disruption in installation of ancillary equipment.

The system was designed to handle a present-day filtrate flow of 4.5 MGD using four UF trains, with phased expansion to accommodate up to 6 MGD in the future with the addition of further modules per train.

Raw water from the South Santiam River can be characterized as having low TOC, alkalinity averaging 16 mg/L, temperature as low as 2.5 degree Celsius and turbidity averaging 4.4 NTU.

Raw water is pumped from the South Santiam River to the site via the Albany-Santiam canal before entering the treatment plant where coagulant is injected inline as in-plant UF feed pumps send the raw water through 200 micron automated strainers. From there, water is filtered through the UF membrane system. Backwash water that is generated from the membranes is collected and sent to waste. Following the UF membranes, the water is then chlorinated for final disinfection and then pumped to the clearwell before being sent to the city's distribution system.

Lebanon - Existing Water Treatment Building

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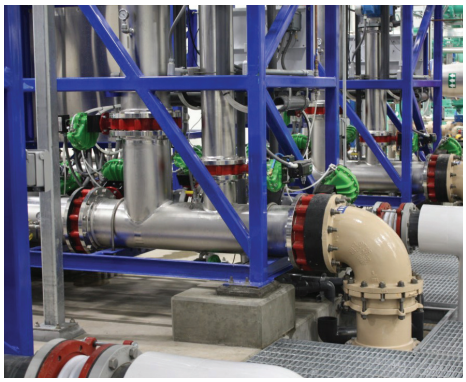

Lebanon - New Membrane System

BUILT WITH FIBERFLEX™

The FiberFlex™ UF system supplied for the City of Lebanon is a universal membrane system designed to fit several different modules from membrane manufacturers. This gives the City ultimate flexibility and negotiating power in the future when the time comes for membrane replacement. The skidded UF membrane racks and control systems were fully factory assembled and tested at H2O Innovation's manufacturing facility to ensure minimal installation labor and time required on-site for system start-up and commissioning. Once the racks were brought into position and connected, the Toray HFU-2020N membrane modules were installed, flushed and integrity tested.

The supporting ancillary equipment was designed and selected to not only handle future expansion capacity, but also to accommodate a different supplier of membrane elements in the future should the owner elect to do so. In this case, operating parameters such as air scour rates, backpulse flows, system cleaning volumes and various chemical recipes are simply changed by the operator at the HMI without requiring additional programming when modules are changed. For maximum reliability these FiberFlex™ trains are equipped with electropolished stainless steel piping and headers as well as vane actuators rated for several million cycles for all pneumatic valves.

RESULTS

The FiberFlex™ UF membrane system was commissioned in early 2019 and since then has provided superior filtered water quality that meets and exceeds the most stringent regulatory requirements. All sequences are fully automatic for easy operation.