



An MBR-RO system designed to reuse industrial wastewater for cooling tower makeup water

APPLICATION: Industrial Wastewater

CAPACITY: 709,000 GPD (2,684 m³/d)

LOCATION: Richmond, Virginia

COMMISSIONED: March 2019

TECHNOLOGY: flexMBR™

BACKGROUND

An industrial manufacturer located in Virginia was interested in novel ways of managing their water use and environmental impact of their plant. Historically they had discharged their wastewater to sewer and paid the city for potable water in their cooling tower makeup. It was determined that constructing an onsite system to treat wastewater to an industrial reuse level was a cost effective approach to solve this problem.

SOLUTION

An MBR was selected as the initial treatment process, with an RO downstream treating a portion of the flow in order to achieve the required water quality. Due to the variable nature and flow of the industrial waste, the facility has integrated flexibility in the MBR design: a sewer interceptor pulls wastewater from the existing sewer up to a maximum flow, and sends this flow to an equalization tank via fine screens.

The wastewater is treated by anoxic and aerobic biological treatment followed by a swing post-anoxic tank that can be converted to additional aerobic volume as influent water quality demands. The system is designed to treat a maximum daily flow rate of 709,000 gpd from the sewer.

From this single bioreactor, the mixed liquor is pumped to three membrane trains, each of which is fitted with a flexMBR™ system.

A portion of the MBR permeate goes to the RO system for polishing and the remaining portion bypasses the RO system. The two streams are blended in a holding tank, which sends reuse quality water to the different points of use on the client's site.

flexMBR™

The flexMBR™ system includes a universal platform support system designed to fit most MBR modules covering an acceptable membrane surface area range. The robust plant controls accommodate a pre-determined range of membrane manufacturer operating parameters, including air scour rates, permeation cycles, cleaning frequency and other process control parameters such as sludge wasting to control MLSS.



Universal platform for support and interchanging membrane modules at Virginia WaterHub™