

# DRINKING WATER PLANT REDUCES COSTS AND INCREASES AVAILABILITY

Flexible Open-Platform Membrane System in a Lime-Softening Application



## Overview

Public Wholesale Water Supply District (PWWS) built PWWS #25 in coordination with Bartlett & West with the objective to merge two former water districts. Doing so resulted in an overall reduction of purchased water costs, increased water availability, and the ability to add new customers in larger numbers than the two former systems allowed. The new plant pretreats raw water from groundwater wells via lime softening; contact clarifiers use lime, oxidant, coagulant, and polymer as needed. Effluent is sent to a recarbonation basin for pH adjustment prior to treatment via the [ultrafiltration \(UF\) system](#).

The UF system consists of three 0.5 MGD (79 m<sup>3</sup>/h) membrane-filtration units with 16 modules installed per unit. The system is designed with N+1 redundancy to maintain overall treated water capacity with one unit offline. The design of the open-platform system will accommodate any one of the four predetermined membrane modules specified for the project's design despite differing dimensions and operational requirements. Additionally, the units are designed with 20-percent spare module capacity, providing operational flexibility simply through the addition of modules. The on-skid waste diversion directs backwash waste to either the waste recovery system or on-site backwash waste pond. Custom components and materials, including stainless-steel piping, were incorporated into the overall design. ■

## RESULTS

**20%**

Spare Module Capacity

**4+**

Compatible UF Modules

**N+1**

Redundant Design

## Project Summary

Drinking Water System  
for Public Wholesale  
Water Supply  
District #25

### Location:

Lawrence, Kansas, U.S.

### Application:

Potable Water

### Process:

Lime Softening  
Recarbonation  
Ultrafiltration

### Capacity:

694 gpm / 1.0 MGD (158 m<sup>3</sup>/h)

### Design Flux:

49.3 gfd (83.8 LMH)

## Highlights

- The plant uses a lime-softening clarification process with the option to dose with ultrafiltration-compatible polymer.
- The ultrafiltration system has an open-platform design.
- On-skid waste diversion allows the plant to send backwash waste to one of two locations.
- The project design allows for custom material and component selection.