



6 MGD Ultrafiltration Plant, Palatka, Florida

Florida's first Municipal UF plant removes TTHMs



Palatka UF plant showing 6MGD Norit XIGA trains in background (horizontal elements) and 1MGD Norit Aquaflex trains in foreground (vertical elements).

The City of Palatka Florida derives its potable water supply from groundwater through multiple wells with varying water qualities. Palatka's relatively high water table is subject to the influence of surface water, resulting in elevated organics levels. Any possibility of infection from these organics is neutralized through disinfection, however, disinfecting leads to other issues. Organics can react with disinfectants, forming carcinogenic disinfection byproducts (DBPs) in the form of trihalomethanes (THMs) and haloacetic acids (HAA5).

Knowing that impending regulatory changes would likely make Palatka non-compliant, the city's commissioners took a proactive stance and made plans to improve the R.C. Willis Water Treatment Plant. Assisted by a consulting engineer the City selected a process of air stripping for H₂S removal followed by oxidation, enhanced coagulation, and ultrafiltration for manganese and TOC removal.

Layne Christensen Company's Lakeland facility fabricated a 6 MGD Primary UF System with Norit XIGA membranes for potable water, and a 1 MGD Secondary System with Norit Aquaflex membranes for backwash recovery. Layne conducted an extensive pilot to validate the performance of the membranes and to determine the operational parameters. The feed water is not easy to treat since the wells cycle on and off, changing the feed quality. Each contaminant (TOC, Manganese, and H₂S) requires different pH levels, chemicals, and treatment processes, so various coagulants, doses, and pH levels were evaluated. The pilot study mimicked the entire process, including the backwash waste from the primary UF, to define an advanced, easy-to-use system for monitoring and control.

The system was installed and commissioned in the fall of 2009. On average, TOC is reduced by 40% using a coagulant dose of 4 mg/L of Alum. The four distribution system sampling points show an average DBP of 55.1 (well below the MCL of 80 µg/L). All four measurement points are reporting below the MCL, thus achieving the City's compliance goals for treatment of DBPs, H₂S, and Manganese. The membranes run continuously, only requiring occasional chemically enhanced backwashes to maintain stable Trans-membrane Pressure and require no offline cleanings.

Start Date: Aug. 2008

Completion Date: Fall 2009

Owner: City of Palatka

Contact:

Melvin Register,
Plant Superintendent, 386-329-0144

Engineer:

Hoyle Tanner & Associates

Layne Contact:

Brian Fraser, Regional Sales Mgr.



1MGD Norit Aquaflex secondary UF skids provides backwash waste treatment to increase system recovery.

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