

Case History:

Drinking Water: Chemical Free Fe & Mn Removal Using **Cuf**

Background

A well with a capacity of 3 MGD (12.4 MLD) is to be brought back online for municipal drinking water in the southern USA. The well water has developed unacceptable issues with iron (1.7ppm) and manganese (0.11 ppm). Residents complained of orange/brown cloudy water and action was required.

Several technologies have been considered to solve the iron and manganese problem including green sand filtration, chemical sequestering agents, GAC filtration, and Purifics' **Cuf** (Ceramic Ultra Filtration).

Solution

Purifics chemical free **Cuf** technology was successfully piloted and purified the water of iron from 1.7ppm to <0.05ppm, and manganese from 0.11 ppm to <0.005ppm. The treated levels are well below their respective MCLs of 0.3 and 0.05ppm. A picture of the sample with the concentrated metals is shown below beside the final effluent.



Concentrated Metals Influent



Final Effluent

Process Verification

The **Cuf** pilot verification was run over a 2 week period using a model L platform as shown at right.

The pH of the influent water was approximately 5.8, and was neutralized in-line using sodium hydroxide to a pH of nominally 7.5. During treatment no chemical oxidants of any kind were used. Purifics' DOA (dissolved oxygen addition) system was utilized to oxidize the iron and manganese. The **Cuf** system was then used to filter and concentrate the oxidized iron and manganese (see picture above). The **Cuf** Pilot was operated at a flow rate of 19 LPM (5 GPM). As the oxidized metals are filtered out of the water, they concentrate in the equipment and are intermittently discharged. The reject rate is less than 0.1% of flow, and is sent to a membrane bag concentrator for easy disposal. Demonstrated power consumption was 30hp for an MGD platform.

Analysis of the **Cuf** effluent was performed by the client, an independent laboratory.



Full Scale Solution

The full scale system will be 3 **Cuf** DM platforms with a membrane design life of 25 years as shown below.



Reference Documents

- DOC3019 **Cuf** Water Purification
- DOC3023 Technical Data Sheet: **Cuf** M Platform
- DOC3020 Technical Data Sheet: **Cuf** DM Platform
- DOC2015 Technical Briefing: THM (& HAA) Prevention & Color Removal
- DOC2029 On-Site Pilot Verification