

# **MEMBRANE FILTRATION**





City of Delaware, Ohio, United States



Clifton, Colorado, United States - FiberFlex™



Emmons County, Colorado, United States

Ultrafiltration (UF) and Microfiltration (MF) enable the filtration of microorganisms and suspended solids found in groundwater under the influence (GWUI), surface water, seawater, waste water and industrial water. UF and MF modules are comprised of hollow fiber membrane with pore sizes ranging from 0.01 µm to 0.1 µm.

## **TECHNOLOGY OVERVIEW**

MF filtration rejects microorganisms and suspended solids greater than the pore size, typically resulting in turbidities less than 0.1 NTU and SDI's less than 3.0. This high-quality filtrate makes MF the preferred pretreatment process for NF/RO and other unit operations when treating wastewater, seawater and surface water.

In addition, Ultrafiltration & Microfiltration have a verifiable procedure to calculate the log removal value (LRV) for cryptosporidium & giardia, allowing it to be the primary treatment for potable water reuse applications.

## **EXPERIENCE**

H2O Innovation has a unique experience in the design and implementation of UF/MF facilities. Our first UF plant was installed in 2005 and since then we have rapidly grown our installed base, in the industrial and municipal markets. To date we have operating facilities built around 6 different membrane manufacturers. This gives H2O Innovation a unique perspective on membrane type, module construction, overall performance and how to successfully implement them based on client's requirements. We are applying this knowledge from the smallest facilities of a few GPM to the largest ones in the tens of MGD.

Our facilities encompass a wide array of feed water qualities:

- Direct surface water
- Surface water with coagulation and/or chemical oxidation
- Industrial waste streams

Where the final product is used for:

- Drinking Water
- Cooling Water - Wastewater Reuse - General Process Water Feed
- Boiler Feed

H2O Innovation also supplied several plant where we supplied both an UF/MF system coupled with an NF/RO system downstream for further polishing of the final effluent.







Sherman, TX, USA - FiberFlex™



Lebanon, OR, USA - FiberFlex™



Oil & Gas End User, AB, Canada - FiberFlex™



Wemindji, Quebec, Canada



Until a few years ago, UF/MF plant designs centered around a unique and proprietary membrane element for the life of the facility. This locked the end users into a single design for the next decades, excluding them from potential technical improvements from other suppliers and exposing them to the risks of a sole sourced supplier. Unlike NF/RO facilities where healthy being competition could be created for membrane replacement, the UF/MF market did not offer such opportunities.

Unlike spiral wound membranes whose sizes and membrane filtration areas have been standardized across all or most membrane suppliers, UF modules can differ from one supplier to another in the matter of their dimensions, their process connections, and their operating sequences. Therefore, a typical UF system fitted with a specific brand and model of UF modules must conserve the same brand and model throughout its life span. This imposes unnecessary limitations to the system's owner when purchasing new modules for his facility.

H2O Innovation launched its FiberFlex<sup>™</sup> platform in 2013 to address this issue and open up replacements to future, better products and trigger competition and innovation between membrane manufacturers for the replacement market.

#### PROJECT APPLICATION **FLOW RATE** YEAR San Diego, CA, USA Wastewater Reuse 40 MGD 2021 Drinking Water 30 MGD 2019 Montevina, CA, USA Valencia, CA, USA Wastewater Reuse 12 MGD 2020 Clifton, CO, USA Drinking Water 12 MGD 2015 Sherman, TX, USA Drinking Water 11.3 MGD 2019 Innisfil, ON, CAN Drinking Water 10 MGD 2018 City of Delaware, OH, USA 6.75 MGD 2013 Drinking Water Lebanon, OR, USA **Drinking Water** 4.5 MGD 2019 Carlsbad, CA, USA Wastewater Reuse 3 MGD 2017 Emmons County, CO, USA **Drinking Water** 3 MGD 2012 2.2 MGD 2011 North Burleigh, ND, USA Drinking Water 1.3 MGD 2014 Robson Raspberry, BC, CAN **Drinking Water** Costa Azul, Mexico Sea Water Desalination 1.1 MGD 2005 West Basin, CA, USA Wastewater Reuse 1 MGD 2014 Raspberry Falls, VA, USA 0.45 MGD 2018 Drinking Water Wemindji, QC, CAN 0.43 MGD 2012 Drinking Water West Deptford, NJ, USA 0.4 MGD Wastewater Reuse 2015

#### PARTIAL UF REFERENCE LIST