



# Ozone Pretreatment in High Pressure Membranes

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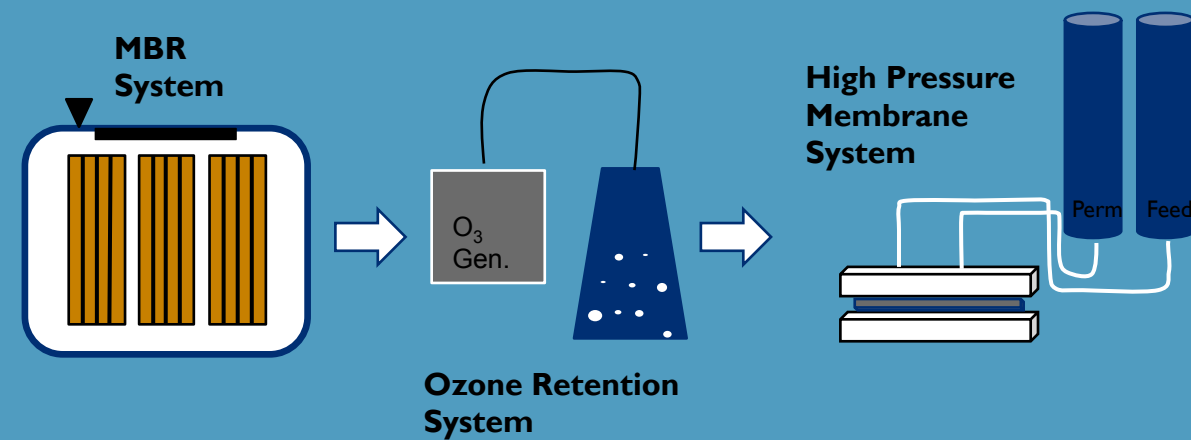
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## Background:

- Potable water reuse is becoming an important component of water resource management.
- Current approach involves microfiltration (MF) followed by nanofiltration or reverse osmosis and utilities have included pre-ozonation to reduce fouling of membrane components.
- Ozone may breakdown organic compounds to the extent that limits the effectiveness of membrane filtration.

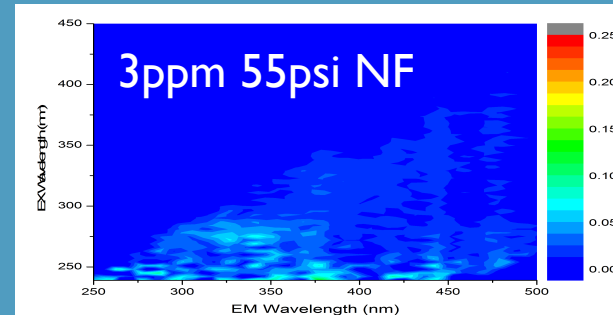
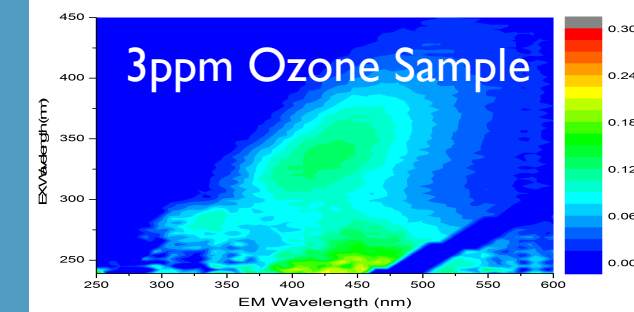
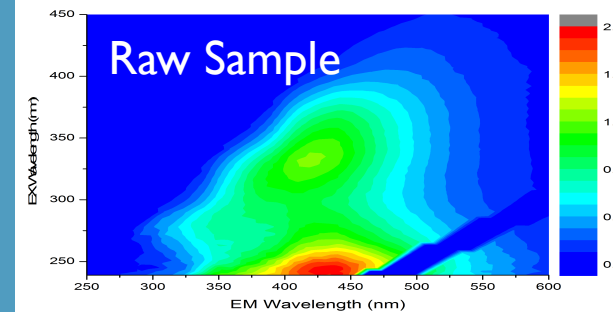
## Experimental Overview:

- Raw and Ozonated Membrane Bioreactor (MBR) Effluent
- Water Quality Characterization
  - Total Organic Carbon (TOC), 3D-Flourescene
  - Ultraviolet Absorbance
- High Pressure Membrane Filtration
  - Nanofiltration, Reverse Osmosis



# Results and Conclusions:

- Ozone testing shows a significant transformation of organic compounds after the introduction of ozone as a pre-filtration disinfectant.
- Total organic carbon and UV<sub>254</sub> absorbance exhibited a sharp decline after membrane treatment while decreasing at a lower degree through nanofiltration and reverse osmosis with the addition of ozone.
- While ozone is a reliable oxidant, the applied ozone dose and use of NF filtration downstream were not able to meet some states' potable reuse standards.



# Future Work:

- Examining the impact of ozone pretreatment on the fouling potential of high pressure membrane systems.
- Introducing an ozone retention system into a pilot scale treatment train with biologically active filtration followed by granular activated carbon to meet potable water quality standard.

