

Proteus™ O₃+BAF Demonstration System

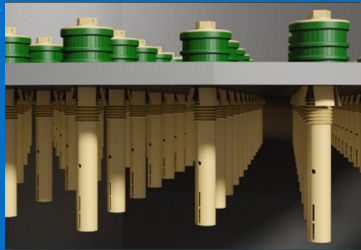
Ozone + Biologically Active Filtration for Direct Potable Reuse Demonstration Facilities

Key Attributes:

- 20 GPM (or customizable)
- O₃ dose based on ratio to TOC or TOC+NO₂
- Target dose of 0.5-1.5 O₃:TOC
- 3' x 2.5' x 16' BAF tower
- 96" max media depth
- 22.4 min EBCT_{max} @ 20 GPM
- Underdrain plate with custom Orthos Type D filter nozzles
- Backwash media retention



GM-Series Ozone Generator



BAF Plate Underdrain

Poseidon Filtration Systems® deliver to municipal clientele comprehensive process technology that includes Ortho-Wash™ controls, Centurion™ nozzle-based monolithic floor underdrains, air manifolds, backwash troughs, filtration media, pumps, blowers, valves, and instrumentation

The **Proteus™** Ozone + Biologically Active Filter (O₃+BAF) Demonstration System, offered by Orthos Liquid Systems, Inc. (ORTHOS), is primarily utilized at direct potable reuse (DPR) demonstration facilities. The 20 gpm Proteus™ O₃+BAF System delivers to utilities a larger-scale, longer-term solution than pilot columns to demonstrate the carbon-based removal of total organic carbon (TOC) and other chemicals in order to achieve high-quality purified water. The Proteus™ forms the core element of carbon-based DPR treatment that meets or exceeds applicable drinking water quality standards while mitigating the brine disposal challenges of processes using reverse osmosis.

To create the Proteus™, ORTHOS formed a strategic agreement with Pureflow Ozone Division, the exclusive US and Canadian municipal engineering partner of Primozone®, a leading manufacturer of ozone generators. The Primozone® GM-1 reactor utilized in the Proteus™ provides straight-forward, efficient operation and minimal maintenance in a compact footprint—an optimal solution. Ozone is dosed based upon influent concentration of TOC (plus nitrite, optionally), monitored by Proteus™ instrumentation.

After the influent TOC is oxidized, O₃-treated water is pumped to the ORTHOS BAF utilizing media-retaining ORTHOS Type D nozzles in an underdrain plate. Up to 96" of media (e.g., GAC, anthracite, sand) may be installed in the 7.5 ft² BAF to create 22.4 minutes of empty

bed contact time at 20 gpm. Proteus™ pumps and compressor provide user-adjustable, concurrent air-water backwash, triggered manually or automatically based on headloss across the filter media, runtime, or turbidity.

The Proteus™ operator panel (with Allen-Bradley CompactLogix PLC and HMI) provides real-time monitoring and control of all instrumentation, automated valves, and equipment for ease-of-use.

“With increased water scarcity, utilities are demonstrating that highly purified reuse water may augment available potable supplies. Proteus™ will prove that carbon-based strategies are extremely effective for full-scale DPR,” stated Stuart F. Humphries, Director of Filtration Technology for ORTHOS. “Proteus™ is another example of our repeated investment in the advancement of industry technology.”

“We are pleased to team with ORTHOS to support Proteus™ systems with our Primozone® generators and equipment,” stated Michael Kennedy, Vice President of Pureflow Ozone Division. “The modular, compact GM-series produces ozone at naturally-higher gas output pressures, resulting in increased ozone concentrations and improved dissolution in water.”

Proteus™ is immediately available for procurement, submittal evaluation, production, and commissioning. Extensive factory support is offered by ORTHOS to ensure optimal operation.

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