

DE NORA TETRA[®] ABF Bioactive Filter

**A multi-barrier approach to treat
challenging contaminants**

REDUCE MICROPOLLUTANTS AND DISINFECTION BYPRODUCTS

**REDUCE YOUR OPEX COST
REDUCE YOUR CAPEX COST**



The Ozone BAF Process

The DE NORA TETRA® ABF bioactive filter combines ozone generation with biologically active filtration for use in municipal water applications. The process targets micropollutant reduction and reduces disinfection byproducts in drinking water and potable reuse applications.

Ozone has long been used to oxidize a wide variety of pollutants in water, wastewater and industrial applications. Ozone alone can oxidize target pollutants, but when combined with a biologically active filter (BAF), the synergy between the ozone and the BAF results in several process benefits.

Instead of the complete oxidation of the targeted organic compounds with ozone alone, the process uses a lower dose of ozone to partially oxidize and break the long chain recalcitrant carbon into smaller biodegradable organic compounds. The smaller chain organic compounds are then removed in the downstream BAF. This process allows for lower ozone doses, and lower capacity ozone equipment versus conventional ozone only treatment.

Treatment Targets

Ozone-enhanced biological active filtration treats the following:

- **Micropollutants such as NDMA, MTBE and 1,4-dioxane**
- **Endocrine Disrupting Compounds (EDC)**
- **Taste and odor caused by geosmin and 2-MIB**
- **Pharmaceuticals and personal care products (PPCPs)**
- **Pesticides and other toxic compounds**
- **TOC removal**
- **COD and BOD reduction**
- **Reduction of disinfection byproducts (DBPs)**



Why Choose a DE NORA TETRA® ABF biologically active filter?

Reduced ozone equipment cost.

Combining ozone with a biological filter reduces the amount of ozone generation capacity required, which means a smaller, less costly ozone generation system.

Reduced energy consumption. Because smaller ozone systems are needed, it means that you need less power to run your requirement.

Process does not require upstream RO or UF membranes.

For indirect and direct potable reuse, the DE NORA TETRA ABF filter does not require expensive to own and operate membrane technology in order to achieve water reuse standards.

Disinfection Byproduct Reduction

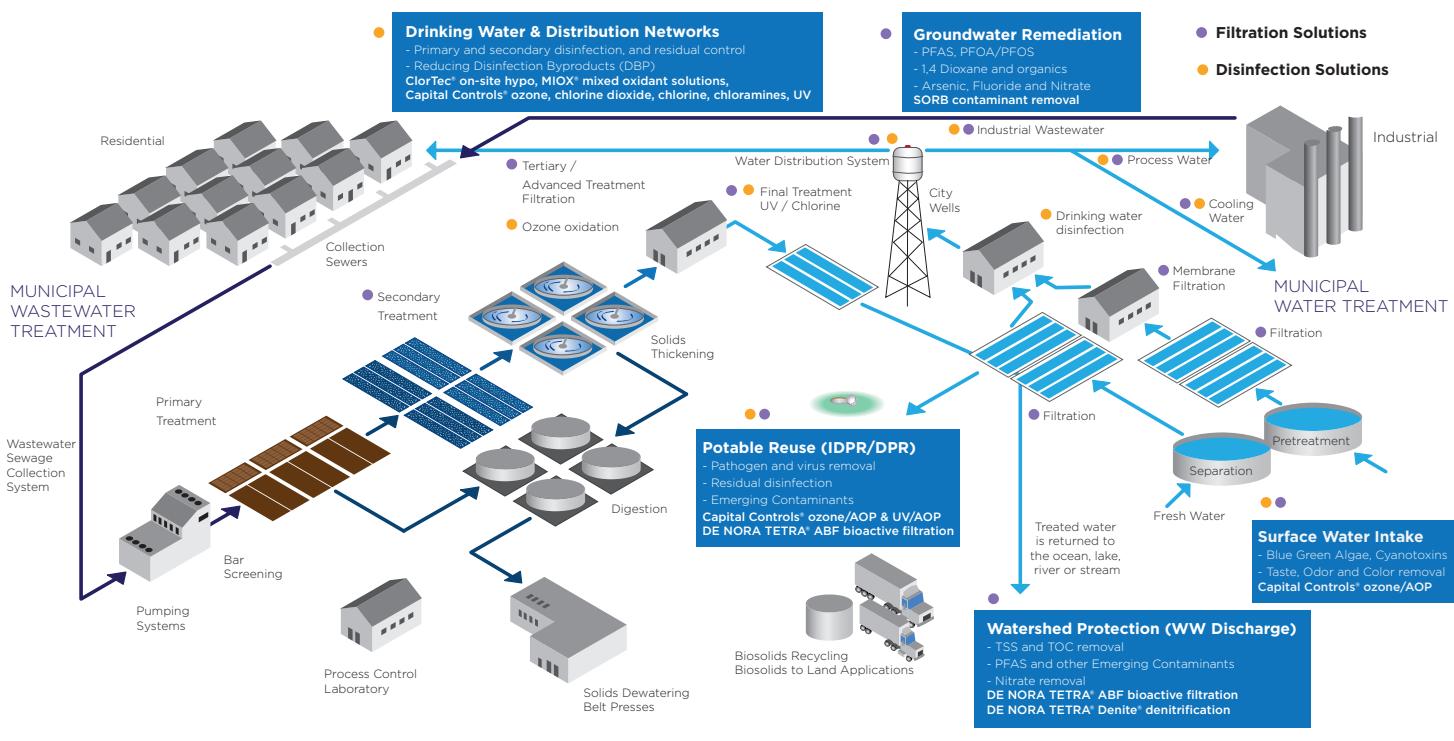
The BAF biologically oxidizes commonly produced disinfection byproducts associated with ozone usage such as bromate, aldehydes and NDMA. It also provides a biologically stable effluent by oxidizing Assimilable Organic Carbon (AOC's) generated by ozonation. Biologically stable effluent lowers the risk of undesirable downstream biofilm growth in the filter.

Indirect/direct Water Reuse

DE NORA TETRA ABF process versus conventional membrane based process such as the Full Advanced Treatment (FAT) using Microfiltration/Ultrafiltration + Reverse Osmosis + Advanced Oxidation Process.

Experience and performance you can trust

More than 30 years experience of ozone and biological filtration across a variety of applications including indirect and direct potable water reuse.



About De Nora

Backed by 100 years of experience, you can be confident in the reliability and safety of DE NORA TETRA[®]. De Nora is the partner-of-choice for communities and companies around the globe. In fact, more than 500 million people around the world drink water treated by De Nora products every single day.

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