



AQUA-AEROBIC SYSTEMS, INC.  
A Metawater Company

# SUCCESS STORIES

## PLANT NAME AND LOCATION

SANFORD WATER TREATMENT PLANT - CITY OF SANFORD, FL

## DESIGN DAILY FLOW

4.5 MGD (17,035 M<sup>3</sup>/DAY)

## AQUA-AEROBIC SOLUTION

Aqua ElectrOzone<sup>®</sup> M-Series 30x OZONE GENERATION SYSTEM



## TURNKEY OZONE PROCESS DELIVERS REDUCED ENERGY USE

In summer 2014 Pinnacle Ozone supplied a complete 500-lb-per-day ozone generation and injection system for the city of Sanford, FL. The new facility provides treatment of up to 4.5 mgd of groundwater for municipal water supply. There were high concentrations of organic carbon, color and H<sub>2</sub>S in the local groundwater. To address potential concerns with THMs and disinfection byproducts (DBPs), the city selected a new ozone + BAC system for the treatment process.

Having committed to an ozone-based treatment process, the city conducted a review of available ozone systems that are installed in a number of nearby communities. Overall, the city found that almost every existing conventional ozone system was lacking in aspects of service, maintenance and operating cost. After thoroughly reviewing the design, technology and operating features of Pinnacle's Zenith ozone generator system, they selected the technology for the new project.

### Approach

As a part of the project, Pinnacle provided a complete turnkey ozone process for the new plant. The new system includes a LOX storage and delivery system, a single 500-lb-per-day Zenith series ozone generator, triplex 890-gal-per-minute side-stream ozone injection system, 30-ton water chiller, ozone destruct system and complete ozone process controls.

The ozone control system for the project involves monitoring and control of dissolved ozone concentration at several locations in the treatment process. Control of the process must be maintained in a relatively narrow band to guarantee sufficient treatment at low dosage, and to prevent damage to the BAC system at high concentrations.

Most importantly, the new ozone system provides a high level of automatic process control and minimizes maintenance. As a



Pinnacle M-Series 30x ozone system selected by the City of Sanford, FL for the WTP facility.

result, operation costs are significantly lower with even higher reliability than were available with older ozone technology.

### Results

Since installation, the new Pinnacle Ozone system at the Sanford water treatment plant has provided smooth startup of the ozone + BAC treatment process. The system provides completely automatic control of the ozone process and which responds to variations in water quality with minimal operator involvement. The new system has also exceeded operating cost expectations by delivering up to 20% lower power use than in the original design.

## Aqua ElectrOzone® PROCESS

Ozone is produced by passing concentrated oxygen in between two electrodes in a high-voltage environment. The electrical current or “coronal discharge” disassociates O<sub>2</sub> molecules into oxygen radicals, which react with other oxygen molecules to form O<sub>3</sub>, commonly known as ozone gas. This highly reactive gas is then dissolved into the water by a Venturi-style injector and retained in solution for a predetermined length of time.

Ozone is capable of destroying precursors to chlorination DBPs, dramatically reducing their formation even if chlorine and chloramines are used later in the water treatment process.

After the predetermined contact time has elapsed, the remaining ozone is removed from the water and destroyed by a heat and catalytic media process. The off-gas is vented to the atmosphere as harmless carbon dioxide and oxygen, and the treated drinking water, now safe and odor-free, is passed on to the final stages of treatment and distribution.

The modular nature of the ozone generator, contactor, and destructor sets allows ozone production and dissolution to be ramped up during times of either high water demand or enhanced treatment needs (such as the seasonal blooms), and turned back down during low-demand times in order to produce cost savings and maximize process efficiency. This level of detailed process monitoring and control allows the City of Sanford to continuously administer the treatment in the most efficient and effective manner possible, making it an ideal solution even as the demands and needs of the city’s customers change over time.

## Aqua ElectrOzone® ADVANTAGES

- Robust design with low breakage
- Reduced discharge gap results in power savings
- Pulse density modulation power
- Precision engineered for high dimensional accuracy
- Consistent ozone generation
- Extremely low failure rates
- Industry’s only truly modular and expandable ozone generator
- Low harmonics
- Oxidizes taste and odor causing compounds
- Coloring components such as pigments and humic substance are decomposed and bleached
- Decomposition of harmful substances and various types of cleansing
- Virus, bacteria and fungi are disinfected and made inert



Ozone injection set detail.

## M-Series 30x

Quick Specs.	M-Series 30x
Ozone Cap. (ppd)(kg/hr)	498 ppd (3.1kg/hr)
Ozone Conc. (% BW)	8-14% BW
Max O <sub>2</sub> Feed (slpm) [scfm]	1650 slpm [58 scfm]
System Turn-down	0-100%, linear
Weight (lbs.)	3730 LBS.
Electrical Service	460 VAC/3 Ø/50-60Hz/125A

