

Quality Effluent: BIO-DENITRO™ + Hydrotech Discfilter

Biological Treatment / Filtration | Case Study

City of Sanford, FL

The Client

The Sanford South WRC consists of 2.0 MGD primary, secondary, and tertiary treatment. The primary treatment includes automatic, continuous self-cleaning mechanical barscreens (1 mm), a screening compacting/dewatering screw system, multi-directional wet scrubber system, flow metering systems, and a “vortex-type” grit removal system.



The Benefits

- Easy to operate
- Produces high quality effluent used for reclaimed water distribution
- Gained value by working with one supplier

The Client’s Needs

In order to meet the demand of growth within the city and to achieve stringent effluent limits, the City of Sanford worked with CPH Engineers to design the Sanford South Water Resource Center (WRC), located in the heart of Central Florida. The facility produces a high quality effluent of reclaimed water standards, which is distributed throughout the region. The plant is a 2.0 MGD “Advanced Secondary plus Filtration Facility.” The plant is easily expandable to 6.0 MGD plus tertiary treatment.

The Solution

Secondary treatment is comprised of a Kruger BIO-DENITRO system which consists of 2 oxidation ditches followed by final clarifiers and RAS/WAS pumping systems.



BIO-DENITRO™

Tertiary treatment consists of Kruger Hydrotech Discfilters, chemical feed systems, and high level disinfection (“bulk” NaOCl).

Treatment of the biosolids includes a sludge holding tank, sludge dewatering system, and Class A biosolids production using an “indirect” sludge drying system, odor control system, and storage silo.



Hydrotech Discfilter

Process Description

To answer the challenge, the Project Manager, Benjamin Fries of CPH Engineers and the City, evaluated numerous biological nutrient removal (BNR) and tertiary treatment technologies for the Sanford project. Mr. Fries and the City's team determined Kruger's BIO-DENITRO and Hydrotech Discfilter combination to be the most cost effective and energy efficient system to meet the City's effluent limits of cBOD < 10 mg/L, TSS < 5 mg/L, TN < 8 mg/L, and a maximum month NH₃-N < 1 mg/L.

The BIO-DENITRO system consists of one (1) influent distributor, two (2) automated effluent weirs, two (2) 7.4 HP submersible mixers, and four (4) 60 HP brush aerators. The BIO-DENITRO system uses a Phased Isolation Ditch (PID) technology that alternates between aerobic (for nitrification) and anoxic (for denitrification) phases. The phases work by separating aeration and mixing in the different ditches, as well as incorporating automated dissolved oxygen (DO) control.

Average Plant Data

	Influent	Final Effluent	% Removal
Flow	1.138	--	--
CBOD (mg/L)	267	1.2	99.6
TSS (mg/L)	288	0.6	99.8
NO ³ -N (mg/L)	*	7.7	--
Ammonia (mg/L)	*	0.02	--

* Influent data not available

The Kruger Hydrotech Discfilter system consists of two (2) HSF2212-2F Discfilter units, installed below ground in concrete basins, for tertiary treatment to meet the plant's TSS effluent requirements. The Discfilters use filter media panels mounted onto vertical disc segments for a small footprint, easy to operate solution.

Testimony

Charlie Turner, Sanford South WRC Utility Plants Manager, stated, "The City of Sanford is pleased with our new plant and the Kruger treatment process. This was my first new wastewater plant startup and to tell you the truth I was not sure what to expect. I can tell you that I was surprised and extremely pleased when we were able to generate reclaimed water quality effluent on the fifth day after initial startup! Our initial regulatory compliance inspection was performed in July, our fourth month of operation. The inspection was successful with no deficiencies indicated on the follow up report. This demonstrates the effectiveness of the Kruger process! I appreciate the support given by Kruger staff at start up and during the shake down period."

Results

The effectiveness of Kruger's BIO-DENITRO system, followed by the Kruger Hydrotech Discfilter, has allowed the Sanford South WRC to produce a high quality effluent for their reclaimed water that is distributed to a reclaim water disposal site, two golf courses, as well as residents and businesses around the area for irrigation.

Kruger

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