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**August/September 2020**

Volume 42, Number 4

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A pilot project was recently completed at a CCUA wastewater facility to biologically reduce phosphorus from wastewater plant effluent using a highly engineered and intensively managed artificial marsh system.

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We welcome guest columnists with editorial perspectives on climate change's influence on coastal resilience planning, the value (or not) of new water quality legislation and the potential benefits of restoring the natural flow of the Ocklawaha River.

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**Got a story lead?**

Got an idea for a story? Like to submit a column for consideration? Let us know. And don't forget to fill us in on your organization's new people and programs, projects and technologies—anything of interest to environmental professionals in Florida. Send to P.O. Box 2175, Goldenrod, FL 32733. Call us at (407) 671-7777; fax us at (321) 972-8937, or email [mreast@enviro-net.com](mailto:mreast@enviro-net.com).

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Photo courtesy of Advanced Environmental Laboratories Inc.

Christiana Patterson, a senior volatiles analyst with Advanced Environmental Laboratories Inc. in their Jacksonville lab, loads samples into an autosampler for EPA Method 8260 analysis for volatile organic compounds. See story below on the current state of the environmental laboratory industry.

## Two Florida wastewater utilities monitor for presence of COVID-19 in inflow, effluent

By ROY LAUGHLIN

Two of Florida's largest wastewater treatment utilities, JEA and the Miami-Dade County Water and Sewer Department, are conducting tests for the COVID-19 virus in wastewater.

Both began sampling and analysis programs in April during the early stages of the statewide lockdown. Each has had a different experience and varying results with their monitoring efforts.

Miami-Dade County's monitoring work was focused on determining if the relative abundance of COVID-19 virus particles found in influent wastewater could provide corroborating evidence of community-wide COVID-19 incidence.

Their conclusion was that, in March and April, COVID-19 was more prevalent than previously thought. At that time, Miami-Dade was a quickly devel-

oping epicenter for COVID-19 infection.

Measurements during that early period of Florida's epidemic indicated that COVID-19 levels in wastewater peaked on April 9.

The city of Jacksonville's experience was markedly different.

Between May 6 and June 7, the utility collected biweekly samples. Only one sample showed COVID-19 present. The remainder were below the limit of

detection.

A shortage of materials and reagents for COVID-19 analysis briefly interrupted the lab work being done at the University of Arizona.

JEA continued to collect samples during the analysis hiatus. As of mid-July, all samples collected since early June had been analyzed for the virus.

**WASTEWATER**  
Continued on Page 16

## DEP issues IP's Cantonment paper mill another consent order

By BLANCHE HARDY, PG

International Paper Co., the largest pulp and paper manufacturer in the world, was issued another consent order by the Florida Department of En-

vironmental Protection earlier this year for its Panhandle mill's wastewater discharges.

Unsatisfied with the state's order, a member of Friends of Perdido Bay, Jacqueline M. Lane, petitioned the state for an administrative hearing.

The consent order was issued to address effluent discharges from the IP paper mill north of Pensacola in Cantonment into nearby Perdido Bay.

The facility processes industrial wastewater, stormwater and pretreated sanitary wastewater from the pulp and paper mill and discharges the effluent into waters of the state.

Lane noted in her petition to DEP that the IP facility has historically operated with a permit attached to a consent order. Her initial petition requesting that the state address toxic effluent from the paper mill was filed in 1986.

"The toxicity, which has been associated with International Paper's effluent continuously since 2012 and intermittently before that, is not likely to be caused by reclaimed water from Emerald Coast Utilities Authority as stated in the consent order," said Lane. "Rather, the toxicity is caused by the resin acids and other chemicals contained in the IP effluent.

"This mélange of chemicals requires

**State of the Industry:**

## Florida environmental labs ride COVID-19 roller coaster

By ROY LAUGHLIN

Our annual report on the state of the environmental laboratory industry looks at current business conditions and notes the trends that may continue into the coming months.

The first few months of 2020 looked much like that of 2019.

But since early spring, it's been shake, rattle and roll for labs as they confront rapidly-escalating costs and take extreme efforts to protect staff and clients from COVID-19 transmission.

Stagnant pricing for lab services remained a challenge in Florida. And for testing laboratories in general, growth rates remained low, less than two percent by one source's estimate.

**Expendable prices, availability**

Last year, environmental lab managers reported that their prices for expendables were increasing noticeably.

Plastics pricing, in particular, rose rapidly.

The same held true for solvents, especially isopropanol, a formerly inexpensive solvent widely used in laboratory procedures.

Worse yet, since the onset of the COVID-19 pandemic, obtaining lab expendables has become a persistently challenge.

Plastic gloves and other everyday labware items are increasingly troublesome to find on a regular basis.

Supplies of solvents are almost as

**LABS**  
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## New biological treatment project removes phosphorus from effluent

By ROY LAUGHLIN

Seattle-based Sustainable Water Investment Group may be writing a success story in biological treatment to reduce phosphorus from wastewater treatment plant effluent.

The company recently completed construction on a pilot project at the Clay County Utility Authority's Fleming Island Regional Wastewater Facility.

The system is essentially an artificial marsh that is highly engineered and intensively managed.

In its first few months of operation, the project produced the desired phosphorus removal level that prepares the county to either send the low-phosphorus effluent to its reuse water system for landscape irrigation or to release it into the St. Johns River.

The Fleming Island facility is designed to treat up to 2.4 million gallons of treated wastewater per day. The Phosphate Elimination System, or PES, media is the key to the facility's phosphate removal performance.

"The PES system provides effective P (phosphorus) removal approaching 90 per-

cent for its design life of six years," notes the SWIG website. "The spent media containing very high amounts of P is then used as a soil amendment. This amendment provides all the P needed for plants, all the while not leaching out any P."

The St. Johns River Water Management District provided funding for the pilot project at the wastewater facility.

The project has a total footprint of 1.1 acres of land.

SWIG contractors excavated several feet of soil from the plot and then installed a liner to confine the effluent during treatment.

Collection pipes were placed at the lowest level of the excavation. Then it was filled with the proprietary PES medium that allows water to percolate through it quickly—at a rate of up to four feet per day.

An array of sprinklers applies the plant's effluent over the treatment area's surface, in some ways similar to conventional WWTP effluent sprayfields. The system also includes an aggregate-sand bed that filters out particulates.

Rotation to subplots where sprinklers operate, water withdrawal from pipes at the bottom of the medium, and flow to the output sump are managed by a supervisory control and data acquisition system.

Mark Merkelbach, a principal with SWIG, said that the SCADA system monitors water flow and water elevations through the system.

The system's patented engineered soil's active ingredient is water treatment residuals, or WTR—the material that settles to the bottom of a treatment pond when a potable water plant treats its raw water with alum or a similar chemical to settle particulates.

Merkelbach said that there is substantial phosphorus binding capability remaining in the alum slurry following its addition to water for treatment.

SWIG carefully vets the material it recovers from settlement ponds to ensure that it contains no undesired contaminants and is sufficiently active for its intended reuse for phosphorus removal.

Sand and organics are then blended with the WTR to create a soil material that has more phosphorus binding capability and much greater percolation rates than natural wetland soils.

The plot at the Fleming Island facility was planted with more than half a dozen emergent wetland macrophytes species.

Merkelbach said that the emergent plants do assimilate nutrients, but that is not their primary role in the system. The plants create and maintain macro channels through the PES and support an aerobic rhizosphere microorganism consortium that performs the majority of the phosphorus retention.

The sprinklers that add and circulate effluent are operated independently on six plots at the treatment facility.

The sprinklers cycle through a three-minute spray followed by a 15-minute percolation period so that effluent has a chance to pass quickly through about four feet of the engineered soil medium.

The normal plant treatment process was modified when the pilot system was added to its effluent treatment train.

Chlorine was not used to disinfect the wastewater before it was sent to the PES system nor was it applied to the wastewater leaving the system.

Phosphorus levels are continuously monitored at inflow and outflow. When phosphorus levels meet targets, the effluent is withdrawn from the PES.

The Clay County plant typically produces an effluent with 700 - 900 parts per billion of phosphorus. SWIG provided the water management district with performance reports indicating that 95 percent of the effluent's phosphorus is removed in the newly operational PES.

**PES**  
Continued on Page 16

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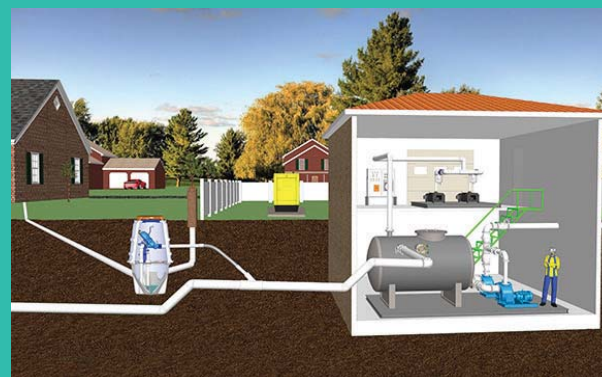


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**PES**

From Page 6

Construction of the facility began in October, 2019, and water was flowing through it for preliminary adjustment by April, 2020. The system has been operating during daylight hours.

Celeste Goldberg, chief customer and public information officer at the Clay County Utility Authority, noted that CCUA had submitted documentation that, upon review, will allow the system to operate 24 hours a day as it was designed to do.

The facility is scaled to be able to treat all of the CCUA wastewater plant effluent produced during usual operating conditions. Unusual operating conditions are, for

example, flooding rains.

The PES facility was constructed and is being operated during its first year through \$1.5 million in funding provided by the Florida Legislature in 2019.

SJRWMD sent out a request to negotiate last year. They received two responses, and SWIG's was the lower priced bid.

The contract terms are pay-for-performance, based on the phosphorus removed. The goal is to remove 6,500 pounds of phosphorus a year, equivalent to 95 percent of the effluent phosphorus over five years.

It will be a year before all the facts are known about the new treatment process at the Fleming Island plant. But, so far, the performance is encouraging.

**WASTEWATER**

From Page 1

JEA anticipates collecting samples for analysis at least through the end of August, 2020.

The abundant presence of COVID-19 in wastewater traveling through Miami's collection system fosters the question as to whether that effluent could be a source of contagion if the collection system overflows, fails or spills after accidental damage.

Repair workers could then be exposed to virus-bearing effluent. This COVID-19 contagion risk to wastewater system workers remains unresolved.

Jacksonville had such low COVID-19 levels in wastewater during the testing interval that the question of risk to workers did not arise.

The research group at UA verified that when effluent is disinfected near the end of the wastewater treatment process, COVID-19 virus particles are no longer detectable.

This indicates that the treated effluent produced by modern wastewater treatment plants is not a source of community contagion.

COVID-19 analysis requires methods used by molecular biologists. It is a distinctly separate protocol from those routinely used in an environmental laboratory specializing in wastewater analysis.

JEA, as noted, sent its samples to a university laboratory. Miami-Dade's samples are being analyzed by Biobot Analytics in Massachusetts.

There have been no reported interruptions of Miami-Dade's sampling or analysis.

The useful news from these two monitoring projects is that COVID-19 is present in collection system inflow to wastewater treatment plants. But so far, wastewater treatment plant effluent is not a source of virus contagion.

Whether influent surveillance can give an accurately correlated estimate of COVID-19 infection rates in the community remains to be determined.

Despite these two examples, wastewater surveillance in Florida appears to be sparse as virus surveillance in humans is the current focus of funding and resource allocation.

This situation will likely persist as long as little is being done in Florida to reduce virus transmission between humans.

**FEDFILE**

From Page 2

The agency identified the following program elements as critical for use by states and other entities for protecting wetlands: monitoring and assessment, voluntary restoration and protection, and regulatory approaches such as the Clean Water Act 401 certification and wetland-specific water quality standards.

Public universities, interstate agencies and intertribal consortia are also eligible to apply for and receive grants under this program.

Applications are requested every two years during odd-numbered years. Awards are made the following year.

**Pettit appointed to EPA advisory committee.** Chris Pettit, the Florida Department of Agriculture and Consumer Services' water policy director, received a notable distinction when the EPA appointed him to its Farm, Ranch and Rural Communities Committee.

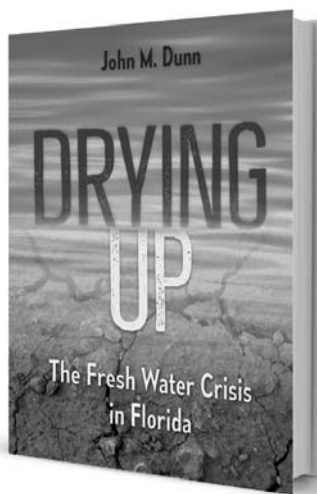
Pettit, one of 33 recent appointees to the FRRCC, will serve a two- or three-year appointment that began on June 15.

He will continue to serve as a director at DACS, dividing his time and effort between the two positions.



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