

SFWMD's novel approach to STAs now underway north of the Everglades

By ROY LAUGHLIN

The South Florida Water Management District is heading in a new direction with stormwater treatment areas it's building as part of the Everglades restoration effort.

The district has contracted with private landowners north of Lake Okeechobee to build, operate and maintain an STA complex on a 2,700-acre tract there.

The STA's location, hybrid design, ownership and leasing options reflect a novel departure from the treatment areas the district now owns and operates.

A complex of multiple cells will treat surface water from the Taylor Creek/Nubbins Slough and the Kissimmee River

watershed before it enters Lake Okeechobee.

The treatment cells will include subareas of engineered marsh that have enhanced phosphorus sequestration capabilities.

Most significantly, the STAs, sited on former cattle ranches north of and adjacent to Lake Okeechobee, will be built and operated under a pay-for-performance contract for as long as a decade.

At the end of the decade, the district may either continue the contract or buy the facility outright.

The planned STAs will remove nutrients from the S-154 and S-154C basins and secondarily from the S-133 basin.

The S-154 basin, according to the

district's water monitoring data, contains the second-highest total phosphorus load levels in the Taylor Creek/Nubbins Slough watershed.

The S-154C basin has the highest load per unit area in the subbasin.

Thus, this project is an ambitious attempt to clean up nutrient releases from the two subbasins contributing the most phosphorus to Lake Okeechobee.

Earlier this year, the district issued an RFP, received two responses and selected a proposal submitted by Ecosystem Investment Partners LLC.

EIP is a private equity firm established in 2007 that provides investment capital for large regional ecological restoration and conservation projects, according to the company website.

In this case, the company negotiated with the district for a pay-for-performance contract that is expected to deliver an effective, large-scale restoration project.

In the past, the SFWMD has built STAs on its own property south and east of Lake Okeechobee.

This project is a combination of standard STA design with the addition of a "phosphorus elimination system," or PES, supplied by Sustainable Water Infrastructure Group LLC.

Last summer, SWIG installed a pilot system at a Clay County wastewater treatment plant.

The treatment system is a lined artificial treatment marsh. The engineered marsh includes a substantial system of sprinklers that control water inflow.

Buried water-collecting pipes are placed just above the impoundment liner.

Water pumps with sensors and computers to control water flow enhance top to bottom water circulation and, SWIG said, significantly increase nutrient removal by soil and aquatic plants.

The soil in the PES treatment cell is the system's secret sauce. It is primarily natural wetland soil that's blended with "water plant residuals," a slurry of chemicals used to treat raw source water at drinking water plants to remove suspended solids and other substances.

The spent "wastewater residual," which still retains significant phosphorus binding capability, is blended with soil to produce an engineered soil used in the system.

That soil, after placement in the marsh impoundment, is planted with emergent wetland vegetation.

The nutrients in the system's water are monitored at inflow and outfall to determine when nutrient concentrations have declined to the treatment target level due to assimilation by plants and sediment.

At that point, the treated water is released, in this case to Lake Okeechobee, and more water is added for treatment. Under most circumstances, the water's residence time is less than a day.

The proposed PES will comprise only 10 acres of the entire available STA acreage.

Earlier this year, Ecosystem Infrastructure Partners purchased two cattle ranches adjacent to Lake Okeechobee, the Rio Rancho and Fernandez Family Trust properties.

The total combined area of the two ranches is 3,350 acres.

Although some areas on project property may not be used for STA construction because they are protected natural wetlands, the number of acres converted to traditional STAs with emergent and submerged aquatic vegetation is expected to be over 3,000 acres.

EIP's conceptual proposal called for the construction of at least four STAs plus several phosphorus elimination systems to service them.

Upon conclusion of contract details, construction of the STA could begin by next year with an expected completion time of two years.

EIP will operate the project for up to seven years. Their level of compensation will be based on the amount of phosphorus removed.

An EIP technical representative said that based on information available from 20 years of operating STAs in the Everglades by the district, the company expects to remove 13-15 metric tons of phosphorus per year.

Under the most optimized conditions, that could increase to 26 metric tons of phosphorus per year. The wetlands will also remove nitrogen, but predictions of how much were not available.

The contract approved by the SFWMD Governing Board will span a 10-year period with a price not to exceed \$300 million.

In its first year, which ended in September, the district board appropriated \$12 million to support project negotiation, planning and design.

The amount of money needed for the construction phase in the next budget year will be substantially higher.

The SFWMD will provide project oversight, but the funding will be provided from the Florida Department of Environmental Protection's budget.

The minutes of the SFWMD board meeting stipulated that any payments in the future will depend upon the availability of funding.

In addition, at the end of the five-year operational period, it is expected that the project facility and title to the land will be transferred to the district at their sole discretion.

This project, if completed, will be the first STA treatment effort located north of Lake Okeechobee and the first of perhaps several within the Kissimmee River watershed.

New Lakeside Ranch pump station complete

Staff report

The final component of the Lakeside Ranch Stormwater Treatment Area Project, the S-191A Pump Station, is complete.

The Lakeside Ranch STA and S-191A Pump Station are key components of the Northern Everglades and Estuaries Protection Program.

The STA is located in Martin County, and the S-191A Pump Station that supports it is located in Okeechobee County.

The project was completed in three phases. Over 1,700 acres of natural wetlands were created in the first two phases, capable of treating stormwater runoff from the S-191 Basin.

The STA is expected to remove approximately 16 tons of phosphorus each year that would otherwise end up in Lake Okeechobee.

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