


**INDIAN RIVER COUNTY, FLORIDA
MEMORANDUM**

TO: Jason E. Brown, County Administrator

THROUGH: Richard B. Szyrka P.E., Public Works Director

FROM: Keith McCully, P.E., Stormwater Engineer 

SUBJECT: Final Update on the Pilot Plant Study for a Full-Scale Managed Aquatic Plant Pollutant Removal System Treating Water from the North Relief Canal

DATE: March 7, 2018

DESCRIPTION AND CONDITIONS

On August 16, 2016, the Board of County Commissioners entered into a contract with Van Ert, Nemoto and Associates, LLC (“VEN”), to perform a pilot plant study to investigate a managed aquatic plant pollutant removal system along the Indian River Farms Water Control District’s (IRFWCD) North Relief Canal. The study is complete and the purpose of this Agenda Item is to summarize results. A brief PowerPoint presentation is part of the Agenda Item.

The pilot plant study consists of four distinct stages:

- Stage 1 – Site Selection, Preliminary Water Testing, and Pilot Plant Construction
- Stage 2 – Pilot Testing: Comparative Testing and Downselect
- Stage 3 – Pilot Testing: Optimal Plants and Parameters
- Stage 4 – Preliminary Full-Scale Design Report

Final results indicate that the most efficient pollutant reduction system should consist of a water lettuce module followed by a non-sloped algal reaeration module followed by a passive wetland polishing system. The majority of the pollutant removal will occur in the water lettuce and algal modules, which will be regularly harvested to remove nutrients contained in their excess biomass.

Design removal rates are:

- Water Lettuce Module
 - Design Aerial Nitrogen Removal Rate = 131.09 grams/meter²-year
 - Design Aerial Phosphorus Removal Rate = 21.20 grams/meter²-year
- Algal Reaeration Module
 - Design Aerial Nitrogen Removal Rate = 60.69 grams/meter²-year
 - Design Aerial Phosphorus Removal Rate = 12.93 grams/meter²-year
- Wetland Polishing System
 - Design Aerial Nitrogen Removal Rate = 46.59 grams/meter²-year
 - Design Aerial Phosphorus Removal Rate = 6.87 grams/meter²-year

Estimated removals for the full-scale system are:

- Total Nitrogen Removal = 8,900 pounds/year
- Total Phosphorus Removal = 1,500 pounds/year

Note that due to the design, the system can tolerate pumping interruptions and is amenable to twelve hour, daytime pumping schedules, when removal rates are anticipated to be optimal, or other pumping schedules. This feature may reduce the electric power costs and operational challenges associated with other facilities, such as algal turf scrubbers, that must pump continuously to maintain system performance and crop integrity.

FUNDING

Funding for the pilot plant study comes from Transportation Fund/Stormwater/Aquatic Plant Pilot Study – Account # 11128138-033190-16031.

RECOMMENDATION

Staff recommends that the County Commission authorize Stormwater Division staff to proceed with final design of a full-scale North Relief Canal pollutant removal system, utilizing the treatment processes recommended by the Pilot Plant Study, and as presented in the attached PowerPoint preliminary engineering design; said facility being located on the County's 18.03 acre property at the southeast intersection of the Lateral A Canal and the North Relief Canal.

ATTACHMENTS

1. Copy of PowerPoint presentation

DISTRIBUTION

Public Works Stormwater Division

APPROVED AGENDA ITEM FOR MARCH 20, 2018