

Comprehensive Everglades Restoration Program

HIGHLIGHTS

UV pilot study and engineering analysis to evaluate potential treatment options for an ASR project that included hundreds of wells.

Basis of design criteria and cost estimates for 1.5-bgd treatment system.

UV and ozonation, in conjunction with bank filtration.

Large UV and ozone cost synergies.

Cost-effective solution to multi-barrier treatment alternative for the challenging water of Lake Okeechobee.

As part of the \$8.4 billion Comprehensive Everglades Restoration Program (CERP), the United States Army Corps of Engineers and the South Florida Water Management District selected Carollo to perform the first pilot testing and engineering analysis of water treatment technologies on Lake Okeechobee. This pilot study provided the basis for design and cost estimates for treatment systems with an ultimate capacity of approximately 1.5 billion gallons per day (bgd).

The CERP presents a framework for Everglades restoration and contains 68 specific components to restore more natural flows of water and improve water quality in the South Florida ecosystem. The plan will restore the habitat of threatened and endangered species and improve fresh water supply in the region. This study evaluated alternatives for treating Lake Okeechobee water prior to injection in aquifer storage and recovery (ASR) wells.

Because of the high organic content of the Lake Okeechobee water, the remote location, and issues with chemical supply and residuals disposal, Carollo proposed an innovative approach using bank filtration, ozonation, and UV disinfection. Carollo conducted a pilot study to evaluate and optimize the proposed treatment process. The study found that ozonation upstream of UV significantly increased water UV transmittance, thereby reducing UV system costs. The optimized process offered significant synergies in terms of cost and reliability compared to using any one technology alone. Pilot study results provided a basis for developing a full-scale conceptual design with capital and O&M cost estimates.



Algae growth upstream and downstream of the medium-pressure UV pilot reactor was an operational issue for the Everglades pilot study. Algae growth is caused by visible light emitted from the medium-pressure UV lamps.