

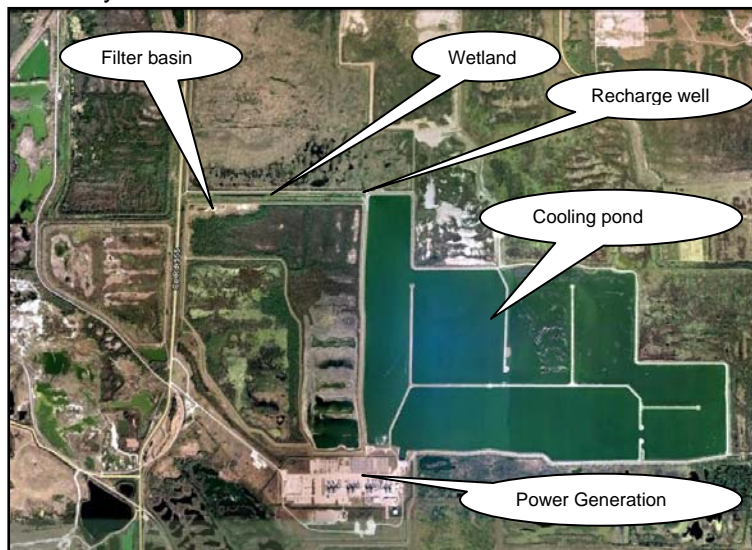
**PROGRESS ENERGY, HINES ENERGY COMPLEX
AQUIFER RECHARGE AND RECOVERY PROGRAM (ARRP SYSTEM)**

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FIELD TRIP LEADERS:

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The Florida Institute of Phosphate Research, Southwest Florida Water Management District and Progress Energy Florida have built and tested the first Aquifer Recharge and Recovery Program (ARRP) system at Hines Energy Complex in Bartow, FL. The field-visit site is to an area of former phosphate mining now occupied by a power-generating station. The ARRP System that will be shown and described is designed to naturally treat cooling-pond water prior to recharge. The ARRP site consists of a natural treatment system that includes an 8,000 linear ft pioneer wetland, a tailing sands filter basin, a recharge well, and a recovery well. The ultimate goal of this site is to treat and recharge approximately 1.1 mgd with possible recovery of 85% at a later date and at a different location.



This project is set up in several phases. The initial phase (now completed) was to construct the natural treatment system and to evaluate the treatment efficiency to remove organic and inorganic contaminants to produce water suitable for recharge. The natural treatment system, designed to treat water from the power plant's cooling pond, has consistently met 134 out of the 140 drinking water standards (DWS). The six exceedances include fluoride, iron, manganese, color and odor, which are all secondary drinking water standards. The only primary drinking water standard that unable to be met was Coliform.

Water quality results were obtained from the treatment system that

meet standards suitable for aquifer recharge. In addition, the system produces water very similar to groundwater with low dissolved oxygen (DO), negative oxidation-reduction potential. This low DO condition of the treated recharge water is likely to reduce the chance of the dissolution of pyrite and the release of arsenic.

A second phase (also completed) was to conduct a bench test using drill cuttings from the recharge well at varying depths and aquifer matrices. Due to the microbial contaminants, tests were also conducted using UV treatment on the water. The results of the bench tests demonstrated that the aquifer matrix geochemistry is complex.

The final phase of this project (in progress) is to conduct in situ recharge and recovery tests using the treated water, recharging it into the Floridan aquifer and recovering the water approximately 250 ft away. The UIC permit issued by Florida DEP requires the construction of several monitor wells, which will also be a part of this final phase. The phase will include geochemical and tracer modeling to determine the extent to which metals are released in the storage and recovery phases.



Additional information: <http://www1.fipr.state.fl.us/FIPR/FIPR1.nsf/470e2f6af65c0b0385256b58005ab96f!OpenView>