
COUNCIL WATER RESOURCES COMMITTEE

MEETING NOTICE AND AGENDA

Thursday, April 7, 2011 - 5:00 p.m.

Rockledge City Hall, 1600 Huntington Lane, Rockledge Florida 32955

Councilwoman Phillips, Chair; Mayor Schultz, Councilman Forester

1. CALL TO ORDER
2. UNFINISHED BUSINESS
 - A. Report: Update on ASR System Status in Florida (Jones Edmunds)
3. NEW BUSINESS – None
4. ADJOURN

JONES EDMUNDS®

ENGINEERS | ARCHITECTS | SCIENTISTS

March 18, 2011

Mr. James P. McKnight
City Manager
City of Rockledge
1600 Huntington Lane
Rockledge, FL 39255

Re: Update on ASR System Status in Florida
UV Validation Testing
ASR Chemical Pretreatment
Jones Edmunds Project No. 08802-034-04

Dear Mr. McKnight:

Jones Edmunds has researched and prepared a status summary of selected ASR sites in Florida with recent activity (as of March 2011), preliminary information on UV system validation testing, and rough costs for a chemical pretreatment system. We have provided the information on three attachments for your review.

Should you desire additional information or clarification, please contact me at your earliest convenience.

Regards,



Rick Ferreira, P.E.
Chief Operating Officer

Cc: Alan LaDuke
Jim Tully

Attachments: ASR Status, March 2011
UV Validation Testing
Chemical Pretreatment

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Status of selected ASR Sites in Florida with Recent Activity (March 2011)

Sarasota County Central WWTP

Recharge water: Reclaimed

Storage Zone: Within the USDW, approximately 500-600 feet below land surface (bls).

Status: Received a minor modification to allow cycle testing with temporary equipment. An Administrative Order is attached to the permit to allow cycle testing to begin and to protect FDEP and the owner should short-term metals mobilization be observed. Equipment is in place, ready to start cycle testing soon. No pre-treatment is planned.

Cocoa Beach

Recharge water: Reclaimed

Storage Zone: Below the USDW, approximately 1,100 feet bls.

Status: The City received a draft FDEP Class V Construction permit on January 25, 2011. A public meeting was held to review the permit on March 3rd. The SJRWMD injection permit was recently issued.

Englewood Water District

Recharge water: Reclaimed

Storage Zone: Below the base of the lowermost USDW, 500-700 feet bls.

Status: This system began cycle testing in June 2001 and received a Class V operations permit in February 2008. This was the first site in the state to receive an operations permit. The well is currently operated on an as-needed basis and stores and recovers 40 to 60 million gallons (MG) of reclaimed water annually. No pre-treatment above high level disinfection is required to store this reclaimed water and the recovered water is discharged directly into the effluent pump station and delivered to its public access reuse customers with no additional post-treatment.

St. Petersburg SW WWTP

Recharge water: Reclaimed

Storage Zone: Below the USDW (located at approximately 400 feet bls), 490-600 feet bls.

Status: This system has been in cycle testing for many years under a Class V construction permit. The City submitted an application for an operations permit. FDEP deemed the operations permit application complete on January 13, 2011, and is working on a draft permit. This is expected to be the second operations permit issued by FDEP in the state for a reclaimed water ASR system. No pre-treatment above high level disinfection is required to store this reclaimed water. The City recovers the reclaimed water back to the head of the filters for post-recovery high level disinfection at this time.

Pinellas Co. – South Cross Bayou WWTP

Recharge water: Reclaimed

Storage Zone: Below the USDW, approximately 750-800 feet bls.

Status: FDEP issued a permit to convert Class I injection wells to Class V ASR wells. The County converted from deep well injection back to surface water discharge several years ago and the injection wells were scheduled to be fully backplugged. Partial backplugging of the injection wells is complete. The County still needs some equipment modifications before they can start cycle testing.

Polk County Utilities – Northwest WWTF

Recharge water: Reclaimed

Storage Zone: Either in or below the USDW, between 2,000 and 2,800 feet in depth.

Status: The County recently completed a feasibility study and is proceeding with permitting its first reclaimed water ASR system. A pre-application meeting was held with FDEP and the program was well received by the Department. The permitting strategy involves looking at zones throughout the lower Floridan aquifer and selecting the best zone that will serve the County in the future. SWFWMD appears to be in support of the project and co-funding should be available regardless of whether the storage is into or below the USDW. If completed into the USDW, the County has committed to use chemical addition to reduce dissolved oxygen in the recharge water to reduce the concentrations of metals mobilized during storage activities.

Oldsmar Water Reclamation Facility

Recharge water: Reclaimed

Storage Zone: Below the USDW, approximately 350-450 feet deep.

Status: Completed the construction of an exploratory ASR well in 2010. The City is currently preparing an FDEP construction permit application that will allow construction of the ASR system, including monitoring wells, and initiation of cycle testing.

Port Canaveral

Recharge water: Reclaimed

Storage Zone: Below the USDW, within the Surficial Aquifer System.

Status: The Canaveral Port Authority's FDEP ASR Construction permit has expired. The Canaveral Port Authority has not contacted FDEP about renewing the permit. Discussions with SJRWMD staff indicate that the recovery rate projections were too low from the surficial aquifer.

Sanford

Recharge water: Potable Water

Storage Zone: Within the USDW, approximately 530-630 feet deep.

Status: The system includes a sodium bisulfite feed and membrane degasification. During Cycle tests 1 and 2, sodium bisulfite only was used. Maximum arsenic concentration was approximately 30-40 mg/L. During cycle test 3, degasification system was operating. Maximum arsenic concentration observed was 11 ug/L. Sanford was able to discharge to the WTP during Cycle Tests 3 and 4.

Deland

Recharge water: Potable Water

Storage Zone: Within the USDW, approximately 190-225 feet deep.

Status: Completed a 20 MG cycle test with a Sodium Bisulfide addition. Maximum arsenic concentration during recovery was 1.3 ug/L.

**UV VALIDATION TESTING
DRAFT
WATER QUALITY SAMPLING PLAN**

Attachment 2

1. Specific Condition 3.a.(1), Permit No. 05-0195980-002, requires that prior to recharge of reclaimed water, the City must collect three sets of water quality samples from the UV system for the following parameters:
 - a. Giardia lamblia
 - b. Cryptosporidium
 - c. Fecal coliform
 - d. E. Coli
 - e. Enterococci

We would also recommend sampling for total coliform during the sampling event. A groundwater discharge standard of 4 colony forming units per 100 mL (cfu/100mL) must be met at the ASR wellhead prior to recharge.

2. The City should be prepared to collect three sample sets on a single day at different times of the day to verify UV system performance. Jones Edmunds recommends early morning, mid-morning and late afternoon.
3. Jones Edmunds recommends that the City collect three sets of concurrent samples upstream and downstream of the UV system.
4. Following UV system validation, the City should continue bi-monthly sampling upstream of the UV system for Free Chlorine Residual, Giardia lamblia and cryptosporidium (count and viability testing, where applicable), fecal coliform, total coliform, E. coli and enterococci. Bi-monthly sampling should also continue downstream of the UV system for Nitrite, Ammonia, Total Trihalomethanes (TTHMs), Haloacetic Acids (HAA5), Free and total Chlorine Residual, Giardia lamblia and cryptosporidium (count and viability testing, where applicable), fecal coliform, total coliform, E. coli and enterococci.

We also contacted the UV system vendor. The vendor visited the site shortly after the system was constructed and ran through the operating procedures with City staff. However, we thought it may be appropriate for the City to bring the vendor back for a refresher. We received a quote last year from Aquionics for \$1,850 for a one day site visit.

Our effort would include contacting the lab to order sample kits and schedule the sample collection. Below is a cost estimate for the water quality analyses assuming the samples will be collected and analyzed by Pace Analytical.

Parameter	Unit Cost	Quantity	Total
Total Coliform	\$ 25	6	\$ 150
Fecal Coliform	\$ 25	6	\$ 150
E. Coli	\$ 65	6	\$ 390
Enterococcus	\$ 55	6	\$ 330
Giardia and Cryptosporidium	\$ 550	6	\$ 3,300
Sample Collection			\$ 400
			\$ 4,720

CHEMICAL PRETREATMENT COSTS TO CONTROL LEACHING OF ARSENIC DURING ASR

Inquiries were conducted to obtain preliminary cost estimates for a sodium bisulfide pretreatment system for ASR. Based on their experience with the Deland ASR project, Entrix estimates a capital cost of \$250,000 to construct the chemical feed system and a small building to enclose the system. Please note that this estimate includes capital costs only and does not include the engineering costs associated with the design of the system. Approximately half of this estimate is for the construction of a new building. Cost saving options may be identified during the design phase of the project, such as utilizing existing structures on the site to house the pretreatment system.

During the ASR conference in September, Entrix stated the chemical costs for the Deland system were approximately \$0.13-0.18 per thousand gallons. Assuming a 90-day recharge cycle at 1 million gallons per day (90 MG total storage), this would result in approximately \$12,000 to \$16,000/year in chemical costs.

Preliminary cycle testing may be performed using temporary equipment. Entrix is developing a mobile system that will be capable of treating recharge water during small-scale cycle testing events. This mobile platform could be used to demonstrate successful performance of the system before investing in permanent equipment. The fee for the mobile pre-treatment equipment during a small-scale cycle test, such as 10 days of recharge followed by 10 days of recovery, at 1 million gallons per day would be approximately \$45,000. This fee would include chemicals, on-site observation, and the required water quality sampling and analysis during recharge and recovery. However, it does not include any modifications that may be necessary at the plant to accommodate the temporary equipment, such as an in-take line upstream of the well head.

Catalyzed sodium bisulfite is another option that is receiving attention in this area. One advantage to this scenario is that minimal modifications would be needed to add the liquid sodium bisulfite to the water prior to recharge. Preliminary cost estimates developed for other ASR applications have been in the range of \$40,000 to \$60,000 of chemical feed to remove upwards of 9 mg/L of dissolved oxygen for the equivalent 90 MG storage volume. Pilot testing of this chemical addition system would be needed to determine if reducing the amount of chemical addition, resulting in less DO removal from the recharge water, would still be able to control arsenic mobilization in the aquifer to acceptable levels. Please note that this type of system has not yet been tested at an ASR facility.