

Application Note

Florida Utility Uses Aqua TROLL® 200 Instruments to Monitor Aquifer Storage and Recovery System

Aqua TROLL 200 tracks groundwater levels and water quality of injected and retrieved water

Application

Aquifer Storage and Recovery (ASR) systems can store large amounts of water deep underground and can reduce development of expensive surface reservoirs. Aquifer storage eliminates evaporative losses typical of surface water reservoirs and offers better protection from tampering. ASR systems may restore and expand the function of an aquifer that has experienced long-term declines in water levels due to heavy pumping conducted to meet growing urban and agricultural water needs.

Drought sparks new technology

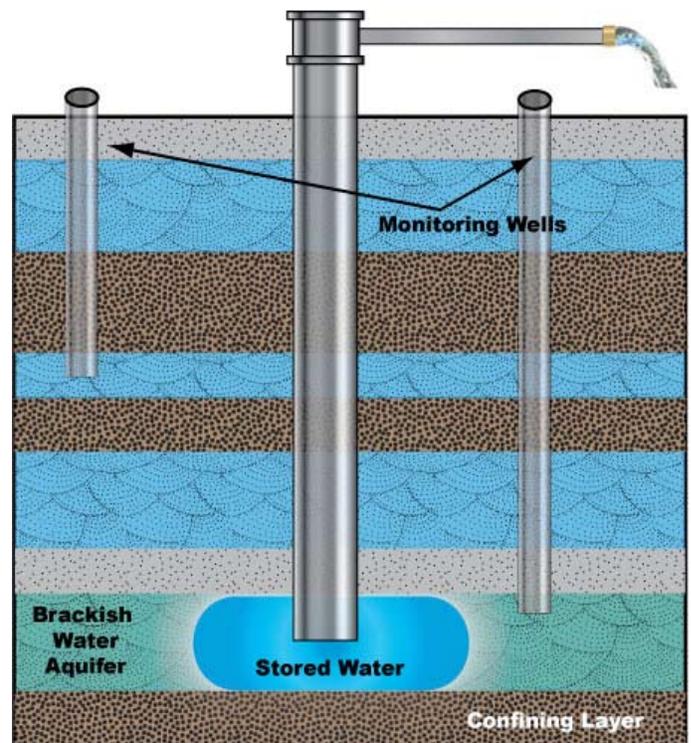
During the 2007 statewide drought, Florida implemented stringent restrictions on water use. Some innovators saw this environmental challenge as an opportunity to look towards developing alternative water supplies.

In order to meet widely variable water demand and anticipated customer-base growth, Lee County Utilities (LCU) in southwest Florida is pioneering an ambitious ASR program (initial ASR cycle testing began in 2000). This program supplements fresh water supply on demand – a plan likely to model a similar strategy for utilities in other coastal states.

Further confirming the commitment of this forward-thinking utility, LCU's Green Meadows Water Treatment Facility was awarded the U.S. Environmental Protection Agency (USEPA) Region 4 Safe Drinking Water Award for Large Ground Water Systems in 2004.

ASR expands water-sourcing options

ASR systems have been developed in the last 10 to 15 years as a practical, alternative water sourcing solution,



Lee County Utilities takes advantage of a limestone formation beneath the Water Table and Sandstone aquifers, the brackish-water Middle Hawthorn aquifer, to inject and store treated water 250 to 400 feet (76 to 122 meters) deep. A “storage bubble” results because the treated water displaces the brackish water.

and LCU has come to rely on its ASR system to meet the demands of a growing customer base.

During the wet months of July through January, the utility's 15-MGD Corkscrew WTP injects 330 MG of treated groundwater into the Middle Hawthorn aquifer. The stored water is retrieved during the higher demand months of February through April via five,

DEP-permitted Class 5 Injection Wells. Randy Edelstein, the LCU hydrogeologist, says that managing the stored water not only supplements water supply during high-demand periods, but, depending on aquifer formation, can also mitigate saltwater intrusion into existing groundwater supplies.

For these demanding monitoring conditions, LCU chose the rugged Aqua TROLL® 200 Instrument from In-Situ® Inc. for reliable data logging and accurate measurements of conductivity, level/pressure, and temperature. LCU is using the flexible Aqua TROLL 200 Instrument to measure groundwater levels and the quality of groundwater as water is injected and then retrieved from groundwater storage.

Sensor targets monitoring needs

In addition to Level TROLL® 500 and Level TROLL® 700 instruments, Edelstein said that LCU decided to use Aqua TROLL 200 Instruments to supplement aquifer level monitoring throughout its inland production-well network.

“When LCU participated in beta (field) testing of the new multi-parameter Aqua TROLL 200, it was evident the sensor could complement the utility’s ASR program,” Edelstein says.

“We want level measurements to monitor the artesian levels and specific conductivity readings to monitor injected and retrieved water quality,” Edelstein explains. “We log readings four times a day, but we like the ability to ramp up the monitoring rate remotely, if needed, through SCADA or a cellular modem technology. Further, the sensor doesn’t require an outside power source.”

New RO plant increases supply

Continuing its commitment to programs that target water conservation and use of reclaimed water, LCU recently installed its new North Lee County Water Treatment Plant (WTP) in North Ft. Myers, which applies reverse osmosis (RO) technology. RO is another option for increasing water supply by using existing sources.



LCU uses Aqua TROLL 200 Instruments to monitor and communicate well level and specific conductivity measurements by SCADA or cellular telemetry. A RuggedReader® Handheld PC with Win-Situ® Mobile Software allows operators to review and evaluate measurements in the field.

This facility allows LCU to tap into the Lower Hawthorn aquifer, where chloride levels can measure up to 1,500 mg/L. The RO process reduces chloride to no more than 100 mg/L. Currently rated at 5 MGD, this \$32 million facility is slated for expansion to 10-MGD capacity within two years. Edelstein reported that they will track aquifer behavior by using Aqua TROLL 200 devices to monitor specific conductivity of the Lower Hawthorn wells. Edelstein added that specific conductivity is the first and best indicator of rapidly changing water conditions, if they occur. For information on the Aqua TROLL 200 Instrument, visit www.in-situ.com.



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Rev. 1, Jan. 2012