

Project Number

WRF-03-009

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Reclaimed Water Aquifer Storage and Recovery: Potential Changes in Water Quality

Principal Investigator:

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Cash Contributors (in addition to the Bureau of Reclamation):

State Water Resources Control Board (CA)

Southwest Florida Water Management District

Objectives

The objectives of this project were to:

- Describe the state of the practice of reclaimed water ASR;
- Identify wastewater constituents and water quality parameters of significance for designing, monitoring, and evaluating reclaimed water ASR;
- Measure concentrations of contaminants at various stages of recharge, storage, and recovery of reclaimed water; and
- Analyze observed data with respect to attenuation mechanisms and rates to characterize water quality changes through ASR.

Benefits

This study investigated the variables of aquifer characteristics, storage time, travel distance, recharge water quality, and operational history. The data support many aquifer process assumptions, such as enhanced activity near the well.

Highlights

- Four reclaimed water ASR sites were selected for participation in the water quality monitoring study two in Florida, one in Arizona, and one in South Australia.
- Total organic carbon, pH, and nutrient reductions observed in this study generally supported the theory that notable microbial and chemical activities occur in the zone closest to the wellhead, where the influx of dissolved oxygen enhances many processes.
- Pathogens and indicator organisms were rarely detected in monitor programs at ASR sites.
- Concentrations of regulated disinfection byproducts, including total trihalomethanes and haloacetic acids, decreased between recharge and recovery at three of four sites.
- The most notable microcontaminant trend was with atrazine, which decreased at the three sites where it was detected.