

# EVALUATION OF A NEW AQUIFER STORAGE AND RECOVERY (ASR) WELL FOR THE ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY, ALBUQUERQUE, NEW MEXICO

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The Albuquerque Bernalillo County Water Utility Authority (Water Authority) is implementing an aquifer storage and recovery (ASR) project at their San Juan-Chama Drinking Water Treatment Plant (DWTP) in Albuquerque, New Mexico. The purpose of the project is to provide drought resiliency, while conserving both surface water and groundwater. The project is permitted by the New Mexico Office of the State Engineer (OSE) through the underground storage and recovery program under permit USR-4, and by the New Mexico Environment Department Ground Water Quality Bureau under discharge permit DP-1887.

For this project, surface water from the Rio Grande that has been treated to meet drinking water standards at the DWTP will be stored in the Santa Fe Group Aquifer System of the Albuquerque Basin, and later recovered and used. A new well, ASR-01, was installed in 2017 and will be used for both injection of the treated water and extraction of the stored water. After equipping the ASR well with a submersible pump and a Baski flow control valve, a demonstration project began in the Spring of 2019 to develop and improve hydraulics of the well, test operational parameters, and evaluate water quality.

Yellow Jacket Drilling of Phoenix, Arizona performed the drilling and testing of ASR-01. Using reverse mud rotary techniques, a 16-inch pilot borehole was drilled to 1,240 feet below ground surface (ft bgs). Lithologic descriptions of the drill cuttings and a borehole geophysics survey were completed using the pilot hole. The geologic units of the Santa Fe Group include the Sierra Ladrones and Ceja Formations. The Sierra Ladrones Formation appeared typical of axial fluvial deposits, and the Ceja Formation appeared typical of alternating floodplain and channel deposits. The pilot hole was reamed to 32-inches before the well was constructed using 20.6-inch diameter, stainless steel, louvered screen and casing manufactured by Roscoe Moss. The screen interval of the well is approximately 400 to 1,200 ft bgs. Filter pack material is silica beads manufactured by Sigmund Linder (SiLi).

Following well development at ASR-01, aquifer testing was performed including step-drawdown and constant rate tests. The step-drawdown test had 4 steps of 200 minutes each with rates of 2,500, 3,000, 3,500, and 4,000 gallons per minute (gpm). Specific capacity ranged from 57 gpm per foot of drawdown (gpm/ft) at 2,500 gpm to 51 gpm/ft at 4,000 gpm. The constant rate test was run for 4 days at 3,000 gpm.

Water quality of the treated surface water and groundwater are of high quality and meet drinking water standards. As water is injected into the aquifer, chemical reactions may occur that could impact water quality. The chemical compatibility of the treated surface water and groundwater was evaluated using the geochemical models PHREEQC and Geochemists Workbench. Based on the modeling results, the waters are compatible, and no adverse chemical reactions are expected to occur due to mixing of the waters in the aquifer or between the water and aquifer sediments. Extensive water quality sampling is also occurring during the demonstration testing.

## Keywords:

Aquifer storage and recovery, ASR, hydrogeology