

## **Hydrologic Characterization of the Fountain Formation: Prospective Aquifer Storage and Recovery Targets**

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**Abstract.** Aquifer storage and recovery (ASR) is a method of water storage that typically involves using the same well to inject water into and recover water from an aquifer. Benefits of ASR include lower capital costs than surface storage methods as well as negligible loss due to evaporation. This method of storing water shows promise for northern Colorado because of the location of existing water supply infrastructure and bedrock aquifers along the Front Range. A potential storage zone for ASR in northern Colorado is the Fountain Formation. The Fountain is a Pennsylvanian-Permian arkosic conglomeratic sandstone with interbedded siltstone and shale that outcrops along the Front Range of northern Colorado. The Fountain is about 800 ft (244 m) thick and dips to the east which gives it the potential for large storage capacity and large yields. This study characterizes the geology and hydrology of the Fountain Formation to assess the feasibility of the Fountain as a storage zone for ASR in northern Colorado. The wide range of facies present in the Fountain were classified and the air permeability of each was measured. Data on existing wells in the Fountain was collected from the Colorado Division of Water Resources AquaMap to estimate the hydraulic properties of the formation. The Fountain has 144 wells in Larimer County with depths of up to 1100 feet and yields ranging from 0.45 to 300 GPM. Calculated specific capacity for wells in the Fountain ranges from 0.0008 to 5 GPM/ft. The Fountain Formation has relatively low measured permeability, but is utilized as a water source along the Front Range and shows the potential for large storage capacity and yields.