Hydrologic Investigation Update of the Rush Springs Aquifer
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Abstract
The Rush Springs aquifer of Oklahoma lies in Blaine, Caddo, Canadian, Comanche, Custer, Grady, Kiowa, Stephens, and Washita Counties and includes the communities of Anadarko, Clinton, and Weatherford, among others. The aquifer underlies about 2,400 square miles and is predominantly used for municipal and irrigation purposes, although other uses include agricultural (non-irrigation), industrial, commercial, and domestic water supplies. Estimated withdrawal from the aquifer in 1990 was about 54.7 million gallons per day, or 61,272 acre-feet per year; 77.8 percent was used for irrigation (Becker and Runkle, 1998).

The predominant geologic formation in the Rush Springs aquifer is the Permian-age Rush Springs Formation. The composition of the Rush Springs Formation is an “orange-brown, cross-bedded, fine-grained sandstone with some dolomite and gypsum beds” and ranges in thickness from 186 to 300 feet (Carr and Bergman, 1976). The Rush Springs Formation is underlain by the well-cemented Marlow Formation, which according to Becker and Runkle (1998), “acts as a confining unit that significantly retards downward movement of water from the Rush Springs aquifer to underlying units”. The western portion of the Rush Springs Formation is capped by the Cloud Chief Formation, confining the aquifer and minimizing recharge in that area.

The 2012 Oklahoma Comprehensive Water Plan (Oklahoma Water Resources Board, 2012) anticipates that several Planning Basins in the current Rush Springs aquifer boundary will experience some groundwater depletion by 2060. One of these Planning Basins is located upstream from Ft. Cobb reservoir, where groundwater depletions could cause a decline of base flow into the reservoir. Concerns on future reservoir yield and storage have also been identified by the Bureau of Reclamation (Bureau of Reclamation, 2006; Ferrari, 1993).

The objective of this presentation is to provide preliminary results of Rush Spring hydrologic study including an examination of methods to determine hydrologic properties, updated aquifer maps, and aquifer water budget.

References