Title:

Characterization of the Antlers Aquifer Based on Surface and Subsurface Geology in South-Central Oklahoma.

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Abstract:

The Cretaceous age Antlers Formation is composed of sands, conglomerate, clays, and limestones that lie unconformably over Paleozoic age rocks. The Antlers has been interpreted as a deltaic sequence that becomes shallow marine as the Cretaceous inland seaway migrated across central North America. Because of its high permeability and adequate recharge, the Antlers is an important aquifer in Southeastern Oklahoma. The last full report on the aquifer was published in 1992 to simulate ground water flow in the subsurface, and studies have been notoriously difficult due to the lack of adequate outcrops. The outcrops that have been identified for this study are located in Carter, Marshall, and Johnston County. By establishing the physical characteristics of the formation in outcrop, we hypothesize that observations of the rocks on the surface can be used to characterize the aquifer in the subsurface. This will be done by locating as many outcrops as possible and describing the various lithologies, how they change vertically and laterally, and taking samples for laboratory investigation. Analyzing the grain sizes in the rocks, as well as porosity and permeability from them, can be used to model how water moves through the aquifer. Along with field and lab studies, subsurface studies will involve looking at electric water and oil well logs, as well as oil well cuttings. The field data and subsurface data will be compared to see if there are any patterns between the two, which may be useful in understanding the characteristics of the aquifer.