

Petrophysical Analysis of "Old" Well Logs in the Phillips Petroleum Company Austin #1: Austin upper Mississippian Field Lea County, New Mexico

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The Phillips Petroleum Company Austin #1 well (sec 17 14s-36e) was completed in 1957 as the discovery well for the Austin Upper Mississippian Field in Lea County, New Mexico. The well had a CAOF of 9.925mmcf/gpd plus 152bc/d and no water from upper Mississippian (Chester) oolitic limestones, and has produced 4.149BCF plus 58,684BC and no water.

The logging suite consists of: 1.) 18'8" Lateral, 2.) 10" Short Normal, 3.) SP, 4.) 32" Limestone Lateral, 5.) Microlog, and 6.) Gamma Ray-Neutron. This logging suite plus the knowledge of the production history gives us an opportunity to compare different methods of "Old Log Analysis" with the production. In the log analysis R_t was determined from the 18'8" Lateral log and porosity was determined from the 32" Limestone Lateral, the Microlog and the old Neutron log. Calculated net pay and HC pore-foot thicknesses for the Austin #1 using $V_{cl} \leq 20\%$, Porosity $\geq 8\%$ and $S_w \leq 30\%$ are 27 feet and 2.4 feet using neutron porosity, 36 feet and 4.3 feet using microlog porosity, and 27 feet and 2.1 feet using limestone lateral porosity. Using the different porosity methods did result in different amounts of net pay and HCPFT, however all of the Old Log Analysis Methods did indicate the productive potential of the Chester.