

Six Days Burning: Geology & Petrology of an Upper Devonian Well Fire Jefferson County, Pennsylvania

C.P. Kuminecz, Seneca Resources Corporation

In December 1992, the Empire Exploration Maslowski #7221 well caught fire during logging. The rig was destroyed and the fire took six days to extinguish, consuming an estimated 9-13 MMcfd. Fortunately, there were no injuries, the well was saved and it was eventually brought online. After a hydraulic fracture the open flow of the well increased to 3.1 MMcfd. The Maslowski well is expected to ultimately produce 263 MMcfd. Cumulative production is currently 253 MMcfd. The source of the ignition is still unknown. The fire was an unforeseen event. But equally unforeseen was the quality of the reservoir, which led to the sustained open flow rates of 1.5 to 2.2 MMcfd, which abundantly fed the fire and made the well difficult to kill. The main productive reservoir, the Cooper Sandstone, is part of a probable Upper Devonian estuary complex that developed following an erosional sea level lowstand. Cross-sections and mapping confirm this interpretation. Petrographic and X-ray Diffraction analyses confirm the favorable diagenetic history, which resulted in the preservation of extraordinary primary porosity and permeability in this normally tight sandstone. Core-derived porosity in the Cooper reservoir exceeds 20 percent and Klinkenberg permeability exceeds 20 md. Natural fractures are not present. The superior porosity and permeability in this reservoir are the result of a favorable inverse relationship between diagenetic rim-chlorite and pore-filling silica cements. Prediction of the occurrence of this favorable relationship prior to drilling is difficult, but general rules guiding its likelihood can be formulated.