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### **Characterization of the Lower Atoka Formation, Arkoma Basin, Central Arkansas**

The Carboniferous Lower Atoka outcrops in the Arkoma Basin of Central Arkansas contain turbidite deposits in a channelized and unchannelized submarine fan setting. Four outcrops, Highway 5, Perryville, Danville, and Chula, were described in detail to determine depositional characteristics and reservoir performance by studying sedimentary facies, vertical succession of beds, sedimentary structures, and other small-scaled features that cannot be resolved in subsurface deposits.

Five distinct sedimentary facies were recognized: Facies A - massive sandstones, Facies B - thin-bedded sandstones with a mudstone drape, Facies C - interbedded thin sandstones and mudstones, Facies D - chaotic deposits, and Facies E - mudstone. Facies and sedimentary characteristics of the outcrops indicate what deepwater environment they were deposited under. Based on this criteria the outcrops were characterized as channelized, channel or channel margin deposits, or unchannelized, sheet sand deposits. Channel deposits consist of massive fine-grained sandstones (facies A), with occasional scouring at the base and rip-up clasts throughout. Channel margin deposits consist predominately of interbedded thin sandstones and mudstones (facies C) with many of the sandstone beds containing small-scaled ripples and laminations. Sheet sand deposits were from lower-energy flows with the presence of more sedimentary structures, less scouring and a higher net-to-gross than the channelized deposits. The Highway 5 and Perryville outcrop were deposited in a middle fan environment as channel and channel margin deposits, and Danville and Chula were deposited in a lower fan setting as sheet sands.