

### **Manning Canyon Shale: Utah's Newest Shale Gas Resource**

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The Manning Canyon Shale in north-central Utah, which has had good gas shows in the past, once again has attracted industry attention. At the north end of the San Rafael Swell, the 22 exploration wells that fully penetrate the Manning Canyon Shale, two of which were drilled in 2008, define a 600-square-mile potential shale gas play area. Average depth to the top of the formation is 7,470 feet. Manning Canyon Shale deposition straddled the Mississippian-Pennsylvanian boundary. In the play area approximately between Helper and Woodside, Utah, the formation is up to 1,200 feet thick, of which approximately two-thirds is a dark gray shale, commonly calcareous and carbonaceous. At this location, the formation was deposited in a shallow structural depression on the craton margin between the incipient Uncompaghre uplift to the northeast and the Emery arch to the south. The organic-rich shale is characterized by high gamma-ray, neutron porosity and interval velocity log values. Associated intercalated lithologies include limestone, dolomite, and varicolored fine-grained sandstone and siltstone. Strata alternate between marine and non-marine. RockEval geochemistry and vitrinite reflectance (Ro) analyses of the organic-rich shale indicate that it is uniformly in the "dry gas" generative window. Measured Ro values from many wells are in the range 1.3% to 1.4%. Many factors point to the excellent gas potential of the Manning Canyon Shale: net organic-rich shale thicknesses on the order of 500 feet and greater, "dry gas" thermal maturities, observed gas during drilling, numerous intercalated brittle lithologies for supporting fracture stimulation of the reservoir, reasonable operating depths, and a relatively large area for the gas play.