**Stratigraphic Architecture, Reservoir Quality, and Sandstone-Body Connectivity of the Mesaverde Group, Central Mamm Creek Field, Piceance Basin, Colorado**

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The reservoir architecture, reservoir quality, and associated sandstone-body connectivity of the lower to middle Williams Fork Formation (Mesaverde Group; Upper Cretaceous) at Mamm Creek field vary with changes in depositional setting. These fluvial and marine sandstones were deposited within lower coastal-plain to shallow-marine and alluvial-plain depositional settings. This stratigraphic interval consists of low porosity and permeability sandstones and contains the main gas producing reservoirs in the Piceance Basin.

The stratigraphic and reservoir characteristics of the lower to middle Williams Fork are assessed using well logs, cores, and borehole image logs from 93 wells on 10-acre spacing across approximately two sections (2 square miles, 5.2 square kilometers). Correlated formation tops for key stratigraphic units establish the stratigraphic framework. Lithology logs and logs that document variability in sandstone-body type (e.g., channel bodies, crevasse splays) have been interpreted within the stratigraphically-complex interval.

Architectural-element logs, paleocurrent data from borehole images, and existing outcrop dimensional data provide inputs to multiple three-dimensional architectural-element models using object-based and multi-point geostatistical methods. These models provide estimates of the "field-scale" spatial variability of the Williams Fork Formation fluvial and marine deposits. Within these deposits, petrophysical (porosity and permeability) models are generated to investigate intra-body or intermediate-scale heterogeneity and are used to estimate pore volumes, show potential fluid-flow pathways, and evaluate static reservoir connectivity. Because there is uncertainty in the spatial variability and size of the deposits (reservoirs), several model scenarios are investigated.