

## **The Pennsylvanian Gothic Shale, Possibly the New Gas Shale Resource Play from the Paradox Basin**

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In the southeast portion of the Paradox Basin, natural gas has been identified in and produced from the Pennsylvanian Gothic Shale as part of a frontier exploration program. This project has focused on the thickest Gothic Shale section located in the Colorado portion of the basin. This anomalous shale section appears to be a prodelta associated with the Silverton Delta. The process of defining any resource play has a steep learning curve and this Gothic Shale Gas Project is no exception. After collecting data and observing completion and production results from a number of Gothic horizontal attempts, one horizontal well completed with the standard size frac used in most shale plays across the country is potentially commercial.

Conventional core, mudlogging, and high-end electric log suites were used to define various properties of the Gothic Shale from numerous vertical wells. A few vertical completions and associated pressure-build-up tests also added to the knowledge of the reservoir. A MWD gamma ray electric log, a mudlog, and a mass spectrometer log were standard use for all of the horizontal wells. Image logs were added later in the program in the lateral portions of a few wells.

Answers from these data helping to understand the hydrocarbon system of the Gothic Shale include: gas content, BTU ranges, maturity, Kerogen type, brittleness, formation pressure, intensity of natural fractures, TOC, percentage of carbonate vs. silica vs. clay, direction of SH Max and fracture sets, and matrix porosity. Once these parameters have been gathered and deemed positive to continue, the remainder of the project involves completion, production, and operational issues that will be constantly adjusted as wells are completed. This is applicable to all shale plays.

The primary lesson learned from this and other shale plays is that tweaking various components of the fracture stimulation to meet the unique parameters of each shale has a significant impact on raising EURs. By coupling this lesson with lower drilling and operational costs in the development mode, the recipe for commerciality will be reached.