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Well Performance and Completion Effectiveness in the Baldy Butte Field, Washakie Basin, Wyoming

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Abstract

The Baldy Butte field is located in the East Washakie sub-basin of the Greater Green River Basin and is several miles east of the prolific Echo Springs/ Standard Draw Almond bar sand trend. Wells are completed in the upper 300 to 400 ft of the Almond formation (Upper Mesaverde), at a true-vertical depth of around 8000 ft. Production is wet-gas (10-14 bbl of condensate/ mmscf gas) and occurs from naturally fractured low-stand deltaic, marine and fluvial point-bar sand deposits. These sands are over-pressured (0.57 psi/ft gradient), possess an average permeability of 0.04 md, and exhibit variable continuity within the field. Most of the field development has occurred over the last 2 ½ years, and has involved contrasting well-completion methods, each specific to the three companies that operate wells in the field. This paper documents an analysis of 29 recent, contiguous completions in the Baldy Butte field, comparing the effectiveness of the three contrasting completion/ stimulation methods. The evaluation was based primarily on use of the reciprocal productivity index (RPI) graphical production-analysis method. Using RPI, daily production and wellhead pressure data for each well was used to dissect well performance, obtaining information on reservoir flow capacity, stimulation effectiveness, reservoir flow geometry, drained area/volume, and produced liquid management. Distinct differences in reservoir quality and effectiveness among the contrasting completion methods were observed.