

THE ROLE OF THE LOWER LODGEPOLE FORMATION IN THE BAKKEN
PETROLEUM SYSTEM, BILLINGS NOSE, NORTH DAKOTA

by
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Golden, Colorado

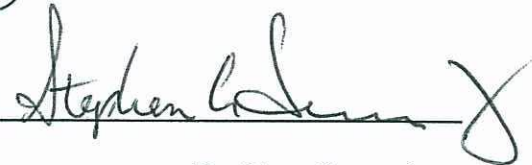
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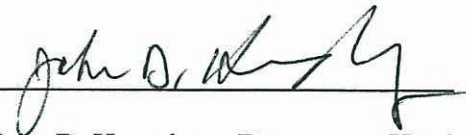
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ABSTRACT

The Billings Nose, located in Billings and McKenzie Counties, North Dakota, has one of the longest histories of production from the Bakken petroleum system of any area in the Williston Basin. The Bakken petroleum system consists of source beds in the Bakken and lower Lodgepole (“False Bakken”) and reservoirs in the lower Lodgepole (Scallion), upper Bakken shale, middle Bakken siltstone/carbonate, and upper Three Forks silty dolostones. Development of the Billings Nose began in the late 1970s with vertical wells that were perforated in the Bakken shale and often in the lower Lodgepole Formation. The Lodgepole reservoir, as with the Bakken and Three Forks reservoirs, has low porosity and permeability, is oil saturated, and is dependent on natural fracturing for reservoir development.

Fracturing is caused, in part, by overpressuring related to hydrocarbon generation within the surrounding source rocks. The False Bakken source bed contains up to 6% TOC and has T_{\max} values of approximately 445° C. The upper Bakken source bed averages about 11% TOC and has T_{\max} values around 450° C. Both beds have reached thermal maturity and are within the peak oil generation phase in the Billings Nose area.

An understanding of source rock maturity, overpressuring, reservoir characteristics, and natural fracture development may assist in the discovery and development of new Bakken producing areas in the Billings Nose area and the rest of the Williston Basin.

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