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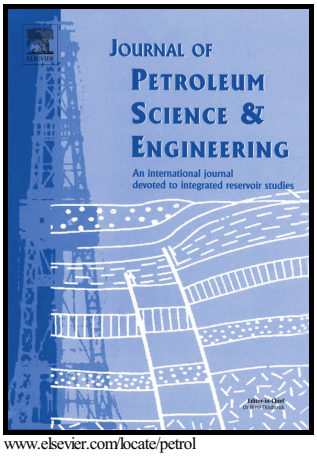

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PII: S0920-4105(17)30356-X
DOI: http://dx.doi.org/10.1016/j.petrol.2017.02.022
Reference: PETROL3886

To appear in: *Journal of Petroleum Science and Engineering*

Received date: 10 August 2016
Revised date: 26 January 2017
Accepted date: 28 February 2017

Cite this article as: Quansheng Cai, Mingyi Hu, Ngong Roger Ngia and Zhonggui Hu, Sequence stratigraphy, sedimentary systems and implications for hydrocarbon exploration in the northern Xujiaweizi Fault Depression, Songliao Basin, NE China, *Journal of Petroleum Science and Engineering* http://dx.doi.org/10.1016/j.petrol.2017.02.022

Sequence stratigraphy, sedimentary systems and implications for hydrocarbon exploration in the northern Xujiaweizi Fault Depression, Songliao Basin, NE China

Quansheng Cai[a,b], Mingyi Hu[a,b*], Ngong Roger Ngia[a,b,c], Zhonggui Hu[b]

[a]Key Laboratory of Exploration Technologies for Oil and Gas Resources, Ministry of Education, Yangtze University, Wuhan 430100, China

[b]School of Geosciences, Yangtze University, Wuhan 430100, China

[c]Department of Geology, University of Buea, P. O. Box. 63, Buea, Cameroon

[*]Corresponding author. humingyi65@163.com

Abstract

Recent drilling data from the northern Songliao Basin reveal considerable hydrocarbon exploration potential in deep-seated small-scale faulted basins. In this paper, the Shahezi Formation of the northern Xujiaweizi Fault Depression within the Songliao Basin was investigated as a case study. Sequence stratigraphy, sedimentary systems and the hydrocarbon exploration potential of the small-scale faulted basin were investigated through observations and descriptions of cores; analyses of conventional log curves, imaging data and logging data; and interpretations of 3-D seismic profiles. Four third-order sequences, mainly controlled by sediment supply and fault activity, were identified based on unconformities at the basin margins and in sedimentary successions. System tracts in the third-order sequences were also recognized through lithological associations and geophysical response characteristics. The distributions of sedimentary systems, including fan deltas, braided deltas, lacustrine deposits, subaqueous fans,