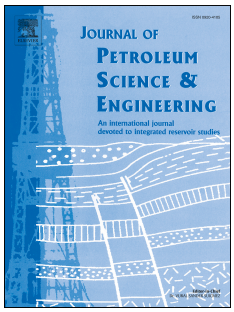
Accepted Manuscript



A quantitative framework for evaluating unconventional well development

Zhenhua Rui, Kehang Cui, Xiaoqing Wang, Ju Lu, Gang Chen, Kegang Ling, Shirish Patil

PII: S0920-4105(18)30276-6

DOI: 10.1016/j.petrol.2018.03.090

Reference: PETROL 4831

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

Received Date: 1 March 2018

Accepted Date: 26 March 2018

Please cite this article as: Rui, Z., Cui, K., Wang, X., Lu, J., Chen, G., Ling, K., Patil, S., A quantitative framework for evaluating unconventional well development, *Journal of Petroleum Science and Engineering* (2018), doi: 10.1016/j.petrol.2018.03.090.

A Quantitative Framework for Evaluating Unconventional Well Development

Zhenhua Rui[a,*], Kehang Cui[a],*Xiaoqing Wang[b], Ju Lu[c], Gang Chen[b], Kegang Ling[d], Shirish Patil[e]
a: Massachusetts Institute of Technology., USA
b: University of Alaska Fairbanks, USA c: University of Tulsa, USA
d: University of North Dakota, USA
e: King Fahd University of Petroleum and Minerals, Saudi Arabia
*corresponding author

Abstract

Gaining a better understanding and measuring unconventional well complexity are vital to developing an oil and gas field successfully. However, there is a lack of quantitative assessment framework for evaluating unconventional wells. This paper created an index evaluation system to assess unconventional well readiness for development, which considers the various well characteristics. The unconventional well complexity index is calculated using five major level-1 elements, and the weight of each sub-element was calculated using the factor analysis statistical method. The well evaluation system was applied to evaluate 20 unconventional well programs for their readiness for development; the evaluation results were analyzed in terms of well complexity distribution and the relationship between unconventional well complexity and duration performance. Recommendations for dealing with various unconventional well complexity were also proposed. The evaluation framework was also verified to be an efficient method for assessing unconventional well development readiness.

Keywords: unconventional well, well evaluation, quantitative framework, factor analysis, well complexity, drilling performance