

Initial Basin Centered-Gas System Conditions in the Cuyo Group, Arroyo La Jardinera Outcrops- Neuquén Basin-Argentina

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Abstract

Basin Centered-Gas Systems (BCGS) are abnormally-pressured gas accumulations that typically lack a downdip water contact and exhibit low-permeability reservoirs. These plays have become one of the most important unconventional gas systems in the world. In the United States, they contribute as much as 15% of the total annual gas production. Even when commercial success has not yet been reported, results are encouraging to consider the play as a major development opportunity. The concept and production potential of BCGS is poorly understood in Argentinean basins and requires significant analysis and experience. Only a few wells with this objective have been drilled in the Neuquén Basin between 2014 and 2017. Using information gathered from outcrops and published literature, we characterized the Cuyo Group in the SW portion of the Neuquén Basin. The petroleum system for the Cuyo Group was analyzed in this part of the basin in order to define which components could make it work as a BCGS, as well as to identify the associated uncertainties and risks. In addition, based on petrophysical and TOC information obtained from outcrops (reservoirs and source rock, respectively) a series of well logs were simulated across typical wells with the goal of reproducing the potential response of future wells under reservoirs conditions similar to those of a BCGS (e.g., fluid distribution and anomalous reservoir pressure). Understanding the processes that control this plays and make them different from traditional petroleum system is fundamental to guiding the exploration and development in other parts of the Neuquén Basin.

Key Words: Basin Centered-Gas Systems (BCGS), Jurassic Cuyo Group in SW Neuquén Basin, Arroyo La Jardinera outcrops

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