Petrophysical characterization of the Pelotas Basin wells: 2-BPS-6A-BP and 1-BPS-7-BP

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Abstract

A petroleum system consists of a dynamic petroleum generating and concentrating physicochemical system functioning in geologic space and time. Over the last few years, the knowledge of reservoir petrophysical quickly increased. Several factors conducted this advance, mainly focusing on the exploratory risk reduction. The petrophysical studies have low-cost acquisition costs and easiness reprocessing as primary characteristics. Regarding this, petrophysical studies are a powerful tool for increasing the precision and accuracy of reservoir characterization. In the southernmost Brazilian passive margin, the Pelotas Basin drilled wells show a few petrophysical studies. We performed a detailed petrophysical analysis on geophysical profiles: Gamma-ray (GR), Sonic (DT), Resistivity (ILD), Bulk Density (RHOB), and neutron porosity (NPHI), focusing on better understanding the porosity, water saturation, and permeability. Our study was performed on the entire sedimentary section of two wells petrophysical datasets, the 2-BPS-6A-BP and 1-BPS-7-BP, located in the central and northern segments of the basin, respectively. We could characterize different lithologies and their petrophysical changes along with the well-log profile. In some intervals, the siliciclastic sediments show evidence of porosity absence; however, in other intervals, the sandstones show evidence of a certain degree of permeability and porosity. Our study provided that a petrophysical approach could better restrict the interesting interval for reservoir studies in the Pelotas Basin and reinforces that the petrophysical approach is a low-cost, high powerful tool for petroleum system characterization.