Geophysical Research Abstracts
Vol. 19, EGU2017-301-1, 2017
EGU General Assembly 2017


# Quantifying the clay content with borehole depth and impact on reservoir flow

Aaraellu D Sarath Kumar (1) and Pallavi B Chattopadhyay (2)

(1) Department of Earth Sciences,IIT Roorkee, India (sarathn79@gmail.com), (2) Department of Earth Sciences,IIT Roorkee, India (cpallavi.fes@iitr.ac.in)

This study focuses on the application of reservoir well log data and 3D transient numerical model for proper optimization of flow dynamics and hydrocarbon potential. Fluid flow through porous media depends on clay content that controls porosity, permeability and pore pressure. The pressure dependence of permeability is more pronounced in tight formations. Therefore, preliminary clay concentration analysis and geo-mechanical characterizations have been done by using wells logs. The assumption of a constant permeability for a reservoir is inappropriate and therefore the study deals with impact of permeability variation for pressure-sensitive formation. The study started with obtaining field data from available well logs. Then, the mathematical models are developed to understand the efficient extraction of oil in terms of reservoir architecture, porosity and permeability. The fluid flow simulations have been done using COMSOL Multiphysics Software by choosing time dependent subsurface flow module that is governed by Darcy's law. This study suggests that the reservoir should not be treated as a single homogeneous structure with unique porosity and permeability. The reservoir parameters change with varying clay content and it should be considered for effective planning and extraction of oil. There is an optimum drawdown for maximum production with varying permeability in a reservoir.