

Rock-typing Development (RTD) - A Tool for Enhanced Reservoir Characterization (A Case Study of “ADSA FIELD” in the Niger Delta, Nigeria)

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The Adsa field is located in the southwest of Escravos of the Niger delta complex, offshore Nigeria, in thirty one feet (31 ft) of water. Recent reservoir characterization study carried out in the field revealed that RTD aided in the intelligent perforation of the cleanest portions of target reservoirs and improved ultimate recovery using the relationship between lithofacies and petrophysical properties. However, the RTD model was employed to effectively characterize reservoirs into flow units based on similar log responses (composite suites of logs comprising gamma ray, resistivity, neutron and density) and thorough core description and transform techniques in addressing variable reservoir porosity and permeability problems at Adsa field.

Thus, the following results were drawn from the RTD modeling study;

Petrophysical properties can be propagated to uncored intervals and in wells not cored using perm-poro relationship.

Reservoir rock can be classified into distinct flow units

Permeability and porosity can vary not only from well to well but also within the same reservoir in the same well.

Five different flow units were determined within the P-01 reservoir, each unit having a distinct porosity and permeability value which correlated with the reservoir lithostratigraphy.

The model aided in the perforation of the cleanest portions of target reservoirs, this increased production.

The research work has demonstrated that rock-typing is the building block that completes the construction of reservoir models, though sequence stratigraphy aids in establishing a geologically valid reservoir framework.