Post-Steam Core Analysis: Reservoir Heterogeneity Impact to Steam-Flood, Duri Field, Central Sumatra

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Duri Field is a giant Heavy Oil Field from Central Sumatra Basin. Most parts of the field are in the mature stage of production under steam flooding recovery. The post steam core study is to achieve understanding of the way the Duri Field sands are processed by steam flood. The objectives are defining the impact of the reservoir heterogeneity to steam flood and drainage mechanism, determine effectiveness of shale barriers or tight sands to restricting steam chest development, assess thin sand drainage efficiency and minimum economic thickness, and integrate dynamic elements such as production and injection history near cored wells.

Three conventional cores were cut through the steam chests in both Rindu and Pertama Formations. Integrated analyses of Log and Rock Properties, detailed Stratigraphic description including facies analysis, were conducted to achieve the study objectives. Additional integration data with the surrounding wells, production data including temperature history, production and observation wells, will benefit the optimum use of the study goals.

The study resulting in better understanding on future perforation strategy; improving optimum use of core physical description; core photos under UV light; fluorescence color identification to define the oil sweeping degree; the importance of permeability versus facies analyses, its role in flow unit definition and thin-layer sweeping efficiency; undetectable burrows activities to define effectiveness of vertical fluid barrier within reservoir compartmentalization; the importance of time-lapse data to predict steam chest development of the area. The study is also confirming the previously understood Gravity Drainage Mechanism in steam flooding process.