Detecting and Avoiding Tar While Drilling, Technique Developed by Saudi Aramco

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Summary of the presentation

The presentation will discuss Saudi Aramco's proprietary pyrolytic technologies to quantitatively assess the volumes of oil, tar and pyrobitumen in oil reservoirs in real time to avoid drilling within unproductive/non-injective zones of tar mats and heavy oil. The technology uses temperature programmed pyrolysis with a flame ionization detection to measure the amount of hydrocarbons in powdered cuttings and core samples. From the results, the yield of light volatile hydrocarbons, thermally distilled hydrocarbons, and thermally cracked hydrocarbons as well as the Pyrolytic Oil-Productivity Index (POPI). The output is then interrogated by modeling software developed by Saudi Aramco (GCrox). The method provides the volumes of oil, tar and pyrobitumen as well as the apparent oil API gravity and the water saturation. These technologies are widely used during real time development drilling in all Saudi Aramco fields that encounter tar mats and also on cored wells during field development planning. Unlike logging tools, this method provides direct measurements of the hydrocarbon composition. The methods were compared to petrophysical analysis and showed good correlations and usually more robust tar predictions. The method helps Saudi Aramco improve success and lower costs associated with field development and water injection plans, reducing the number of side tracks and avoiding rig time loss by minimizing drilling in tar zones. The presentation will shed the light on some examples of drilling success.