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Innovative Carbonate Reservoir Modeling: Example from Mishrif Reservoir, Iraq

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SUMMARY

Integrated reservoir characterization has a large impact on reservoir management and therefore on reservoir forecasting. The use of dyanamic data in reservoir characterization has become increasingly important, particularly when it comes to permeability modeling.

An integrated carbonate reservoir modeling approach is presented for the Cretaceous Mishrif Reservoir in the West Qurna in Iraq. This modeling approach calls for integrating static data including petrophysical information from logs, geologic concepts of the Mishrif Reservoir, core data, as well as dynamic data.

Microporosity, which is present in the Mishrif Reservoir, is defined from core and logs and geostatistically distributed throughout the reservoir using geologic concepts to control the microporosity distribution away from the wells. The microprosity has an effect on both saturation and permeability.

An innovative technique is presented in integrating core permeability and dynamically derived permeability from production data to condition permeability distribution. The technique successfully captures the high flow zones observed from production data and integrate them into the higher resolution geologic model. Flow meter data (PLT) is used to allocate the total permeability from productivity.

The geologic model is simulated to measure the impact of the reservoir characterization and its effect on the depletion plan and the reservoir forecasting.