



APPLICATION NOTE

Modeling Uncertainty in Discount Factors for Turbidite Channel Reservoirs

In general, oil recovery factors in many turbidite channel reservoirs are well below 40% while comparable turbidite sheet sand reservoirs are above 55 percent. It therefore seems necessary to investigate the effect that channel architecture has on recovery factor and include the impact in the project rewards.

To achieve this however is problematic. One, the required geological detail results in computer models that are too large to run efficiently. Secondly, there is a large uncertainty in some of the geologic elements that may impact recovery. As a result a large number of statistical realizations are needed. For these reasons it was decided to perform sector model simulations to quantify the effect of geological detail and incorporate the results as a discount factor to the full field simulations.

The process consists of the following steps:

First, create a number of geological sector models that represent the range of reservoir architecture focusing on the details that impact recovery efficiency.

Second, investigate the statistical occurrence of each of the reservoir architecture scenarios (“reservoir-architecture” distributions).

Third, simulate the sector models in full detail and at a scale similar to the full field simulation model scale. Divide the fine scale recovery factor (RF) by the coarse scale RF to obtain the discount factor for each geological scenario.

Fourth, combine the “geological-scenario” relation tree, “reservoir-architecture” distributions and simulation results to give on discount factor distribution.

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