5.4 **Resource Characterization and Reservoir Modeling of Oil Shale Deposits in Uinta Basin, Utah**

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Although the largest oil-shale deposits in the world are documented to be in the Green River Formation of the western United States, sedimentological characterization of oil-shale bearing strata of the Green River Formation is still poorly documented. In this project we have developed a dataset of wireline logs (mostly gamma ray, some resistivity) with a good coverage for the entire Uinta Basin. Our well-core study shows that oil-shale intervals are interbedded most commonly with limestone ($CaCO_3$), dolomite [$CaMg(CaCO_3)_2$] and calcareous shale, and subordinately with siltstone, sandstone, and nahcolite ($NaHCO_3$). Basin-wide mapping of associated rocks and assessment of their physico-chemical impacts during oil extraction have considerable significance in exploitation strategies.

In the second part of the paper, we examine the production of oil from the reservoir based on the upscaled version of the geologic model. A multi-layer reservoir model was created and the process of oil production from the reservoir was studied using four coupled sub-models. The heat transfer model determined the temperature profiles in the reservoir based on assigned or calculated thermal properties. The reaction model determined the rates of formation of oil, gas and coke. The geomechanical model was used to compute reservoir properties as material transformations occurred and the multiphase flow model was employed to compute oil, gas and water rates to the surface. The reaction model was the most sensitive in determining the process outcome. The tightly integrated exercise of geologic characterization followed by simulation revealed the importance of accurate geologic characterization for executing a successful shale oil production project.