SECONDARY RECOVERY—A NEW CHALLENGE TO GEOLOGISTS

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Geologists should develop new methods of objectively evaluating reservoirs and defining geological features in terms of reservoir properties. Detailed reservoir description is necessary to properly design secondary recovery projects. The necessity of good design is becoming increasingly important as the processes become more expensive and complex and prospective pools less desirable. Traditional subjective and pictorial geology of petroleum exploration with its emphasis on historical concepts does not provide the quantitative information on rock features required by the recovery engineer.

The detailed geological analysis of reservoirs should place full reliance on the "scientific method" rather than the intangibles of intuition and technical experience. Representative sampling, measurements with known limits of precision, and an objective, often statistical, approach to geological data are required. By such practice, the development of new geological techniques should solve the three major objectives of reservoir geology:

1. The identification and distribution of the significant rock features of a reservoir—significant to reservoir performance, that is.

2. The *quantitative* relationship of these rock features to reservoir properties such as permeability, porosity, effective reservoir thickness, vertical displacement, and chemical composition of the porous medium.

3. The three-dimensional picture of the areal and vertical distribution of reservoir properties in such a form that any increment of the data is readily available to the production engineer.

The systematic concentration on painstaking measurements of the significant features of rock geometry, their relationship to reservoir properties, and the incorporation of these data in a quantitative scheme of areal and vertical variability: this is the challenge of secondary recovery to geologists.