IPTC 11778: **A Critical Review for Proper Use of Water-Oil-Gas Transfer Functions in Dual-Porosity Naturally Fractured Reservoirs – Part II.**

M. Al-Kobaisi, H. Kazemi, B. Ramirez, E. Ozkan, and S. Atan.

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**Abstract:** This paper is Part II of SPE 109821. In Part I, we discussed the viability of the use of simple transfer functions to accurately account for fluid exchange resulting from capillary, gravity and diffusion mass transfer for *immiscible flow* between fracture and matrix in dual-porosity numerical models. Here we will show additional information on several relevant topics, which include (1) flow of a low concentration, water-soluble surfactant in the fracture and the extent to which the surfactant is transported into the matrix, (2) an adjustment to the transfer function to account for the early slow mass transfer into matrix before the invading fluid establishes full connectivity with the matrix, and (3) an analytical approximation to the differential equation of mass transfer from a fracture to the matrix and a method of solution to predict oil drainage performance. Numerical experiments involving single-porosity, fine-grid simulation of *immiscible* oil recovery from a typical matrix block by water, gas, or surfactant-augmented water in an adjacent fracture were performed. Results emphasize the viability of the transfer function formulations and their accuracy in quantifying the interaction of capillary and gravity forces to produce oil depending on the wettability of the matrix. For *miscible flow* the fracture-matrix mass transfer is less complicated because the interfacial tension between solvent and oil is zero; nevertheless, gravity contrast between solvent in the fracture and oil in the matrix creates convective mass transfer and drainage of the oil.