How Much Will Your Carbonate Flow?

Taras T. Dziuba

Nexen Inc., 801 7th Avenue SW, Calgary, AB T2P 3P7

Taras_Dziuba@nexeninc.com

Introduction

In today's economic environment, decision makers working in carbonates need reliable predictions of deliverabilities and reserves to make business choices. Too often the explorationist is left guessing at flow rates because carbonate heterogeneity is too complex to unravel. An attempt will be made to provide useful tools that will enable the explorationist to make accurate predictions of flow rates prior to drilling or completion decisions.

Theory and/or Method

The key elements in the prediction of carbonate flow rates are net pay (h), *in situ* permeability (k), pressure (P) and skin (S). Accurate assessment of these elements incorporates an understanding of the depositional environment that determined matrix quality, and rock attributes such as grain sizes, the absence or presence of fractures and degree of cementation. In water-drive systems, the effect of hydrodynamics on recovery factors needs to be included. Effective porosity (Øe), not total porosity (Øt), must be used in the calculation of net pay. Useful logging tools such as the laterolog / Rxo combination simplify the calculation of net pay by highlighting invasion of the porous rock, the "moved hydrocarbons" methodology.

Examples

Analogue work is paramount in the prediction of hydrocarbon flow rates. The Devonian Blueridge Edson "A" pool was used as an analogue for prospects at Berland and Obed in the Wildriver sub-basin. Core, samples and logs were studied extensively and the proposed methodology was applied at that stage. The wells were discoveries and the deliverability prediction was accurate.