A NEW METHOD FOR INFERRING RESERVOIR INTERWEILL CONNECTIVITY AND ITS APPLICATION IN BZ OILFIELD OF BOHAI BAY

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ABSTRACT

Knowledge of interwell dynamic connectivity and finding out injection water flow direction is an important content of reservoir evaluation. The injection wells, production wells and reservoir porous media consists of a complete system. Injection rate of injection wells is the excition of the system while produced rate of production wells is the response of the system. Injected signal exhibits attenuation during its propagation process in reservoir porous media. Based on an evaluation index which characterizing the injection's attenuation, a mathematic model for interwell dynamic connectivity invertion was established by method of signal processing. By this method, injected signals will firstly be preprocessed by use of a convolver and then be used to infer interwell connectivity. The solution method of the model was proposed based on least square method. The model was applied to numerically simulated data on a homogenous synthetic field consisting of five injector and four producer. The connectivity coefficient was calculated by this method and the interwell dynamic connectivity graph was drawn using the connectivity coefficient got from invertion. The results shows that the interwell dynamic connectivity coefficients are consistent with the real reservoir condition. The model was also applied to inhomogeneous field(BZ reservoir of Bohai Bay) and the result consistent with the result of tracer test.

Keywords: Interwell connectivity; injection's attenuation; connectivity coefficients.