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(54) **METHOD FOR VALIDATING A DOWNHOLE CONNATE WATER SAMPLE**

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(57) **ABSTRACT**

A downhole connate water sample drawn from the formation surrounding a well is validated when mud filtrate concentration is acceptably low. A preferred method includes drilling the well with a water-based drilling fluid, or more generally a water-based mud (WBM), containing a water-soluble dye. The dye acts as a tracer to distinguish connate water from WBM filtrate in a downhole sample of formation fluid contaminated by mud filtrate from the water-based mud. Preferably, an optical analyzer in a sampling tool measures light transmitted through the downhole sample to produce optical density data indicative of dye concentration. Preferably, optical density is measured at a first wavelength to obtain a first optical density, and at a second wavelength, close in wavelength to the first wavelength, to obtain a second optical density. First and second optical density data are transmitted to the surface. At the surface, in a data processor, the second optical density is subtracted from the first optical density to produce a third optical density that is substantially free of scattering error. The data processor validates each sample that has an acceptably low third optical density. The invention also provides a method of determining when to collect a sample of downhole fluid drawn over a period of time from a formation surrounding a well.

18 Claims, 3 Drawing Sheets