7.1 **Log Interpretation Parameters Determined by Analysis of Green River Oil Shale Samples: Initial Steps**

Michael Herron, Malka Machlus, Susan Herron

Schlumberger-Doll Research, Cambridge, MA, United States

Determination of those parameters which are suitable for converting Green River well log data into useful variables is a challenging task because the formation components are very different from those encountered in conventional oil reservoirs. Among the differences are the solid nature of the hydrocarbon and the presence in significant abundance of unusual minerals such as dawsonite and nahcolite. We have found that a useful approach in such a case is to develop a data table of measurements made on core and outcrop samples comprising quantitative mineral abundances, chemical concentrations, and computed properties from nuclear forward modeling. As a prelude to mineral analysis of Green River samples, we have upgraded our analysis system. In 1993 and 1997, we showed that assemblages of common sedimentary minerals could be quantitatively analyzed using Dual Range (combined mid- and far-IR) Fourier Transform Infrared (DRFT-IR) spectroscopy. The technique relied on rigorous sample preparation procedures which produced spectra that honored the linear portion of Beer-Lambert law. We analyzed known artificial mixtures as a function of the spectra of standard minerals and in each case, the standard errors of our technique were 1-2 weight percent. Mineral standards now include quartz, feldspars, calcite, dolomite, ankerite, siderite, illite, smectite, kaolinite, chlorite, glauconite, muscovite, biotite, pyrite, dawsonite, nahcolite, trona, and halite. We have collected over 110 outcrop samples and 100 core samples from the Green River formation in Colorado, Utah and Wyoming. Analysis of chemistry and mineralogy of these samples is underway and nuclear logging properties are computed from those results. Preliminary results will be presented.