



## **Whole Rock and Mineral Geochemical Analysis: Why it's Important, and How to Plan a Program**

*Graham R. Spray*  
*AGAT Laboratories*

### **Abstract**

Optimizing the economic performance of a reservoir is a focus for petroleum companies at any point in the market cycle, but becomes a top priority during a lean year. Understanding risk is a big part of the decision process that underlies optimization, and the reduction of uncertainty plays a role in developing that understanding.

We present a review of geochemical analysis methods, their uses independently and in concert, and some strategies for analysis programs that can effectively reduce uncertainty. Differing plays – such as conventional clastic, carbonate, heavy oil, and shale – require particular analysis strategies for greatest value. Various analysis methods such as XRD (bulk mineralogy), XRF and ICP (bulk elemental chemistry), SEM-EDX and Microprobe (specific mineral chemistry), QEMSCAN (a mix), and other techniques have particular advantages and disadvantages that may in part be play-controlled.

Effective analysis programs are designed to address specific questions about a particular play or reservoir. A geochemical analysis program should tackle these questions in a way that produces actionable results.