

**Examining Stimulation Options in Light of Big Lime Geological Characterization,**  
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It is rare for E & P company geologists and engineers working in the Appalachian Basin to have detailed knowledge of actual reservoir properties and rock characteristics. A limited technical paper search returned nothing in literature pertaining to the etched acid conductivity resulting from fracture acidizing of the Mississippian age Big Lime formation in West Virginia. This is surprising because fracture acidizing is an everyday procedure used to enhance Big Lime hydrocarbon recovery. A Kanahwa County core of the entire Big Lime interval and the top of the Big Injun sandstone was obtained for geological and core flow study from the West Virginia Economic and Geological Survey.

The objectives of the core analysis were twofold: first, to characterize the framework mineralogy, cements, clays, and porosity types of the samples, and second, to evaluate that characterization in light of the laboratory effectiveness of hydrochloric acid to induce an etching pattern necessary for satisfactory reservoir stimulation.

Reservoir quality varied in the samples from poor to good due to variations in detrital carbonate sand size, degree of dolomitization, and the occurrence of authigenic quartz. Natural fractures were noted in the upper limestone interval but not in the dolomitic section.

Acid solubilities of select samples averaged 90 percent in 15 percent HCl. In practice nearly all operators pump foamed HCl acid as their stimulation fluid in the Big Lime. Laboratory tests evaluated the effectiveness of foamed versus non-foamed HCl in creating favorable etching patterns in dolomitic Big Lime cores.