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### **Nature of the Problem**

A fundamental control on aquifer behavior is the distribution of open space (porosity) in subsurface rocks. A direct benefit of understanding the distribution of porosity is the ability to better predict aquifer performance. My intended research will involve advanced study of heterogeneity in various kinds of carbonate rock fabrics, particularly those linked to depositional and diagenetic formative processes. Fundamental to this pursuit is identifying the origin of pore networks in carbonate rocks, and developing the fastest and most reliable methods to characterize such networks. Three methods are commercially practiced and are applicable to my research: 1) the use of the nuclear magnetic resonance tool (NMR), 2) the use of mercury injection capillary pressure measurements (MICP), and 3) the use of petrographic image analysis (PIA). No comprehensive study has attempted to address the relationships between these methods. The results of this study will illustrate the most rapid and reliable ways to obtain petrophysical data including pore origin and distribution, and will allow further quality assessment when mapping the aquifer/reservoir flow units. This integrated approach relies on direct measurements of rock properties and will provide insights into improved recovery of fluid media from the Earth.

### **Intended Career Path Statement**

I hope my career path to include further research related to fluid flow in heterogeneous carbonate rocks. At this time the petroleum industry is quite attractive and can provide substantial opportunity to pursue my research interests. I believe an oil company to be the most likely candidate for future employment. Having stated such, I carefully consider all opportunities. I would be interested in environmental and water resource issues (including waste contamination and remediation for example) if such were presented to me.