Technical recommendations have recently been published by the U.S. Environmental Protection Agency to address site characterization needed to support selection of Monitored Natural Attenuation (MNA) for cleanup of inorganic contaminant plumes in groundwater. Immobilization onto aquifer solids provides the primary mechanism for natural attenuation of metals and long-lived radionuclides that are frequently encountered in contaminated groundwater. In order to reliably evaluate the capacity for and stability of contaminant immobilization within the aquifer, mechanistic characteristics of the partitioning process and identification of the subsurface components that influence the extent of the immobilization reaction need to be understood. This requires information on the abundance and chemical speciation of solid phase reactants and products that participate in the immobilization reaction. Analysis of data requirements and analytical approaches used to acquire solid phase characterization data and project contaminant mobility will be provided for two case study sites. MNA was evaluated as a potential component of the groundwater remedy at these sites, where arsenic or uranium is the primary inorganic contaminant of concern. This is an abstract of a proposed presentation and does not necessarily reflect EPA policy.