ITRC's Guidance for Characterization and Remediation of Fractured Bedrock: Part 2 Remediation

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Background/Objectives.
After decades of contaminated site characterization and remediation, our understanding of the distribution, fate, and transport of contamination, and implementation of remedial technologies have improved such that numerous sites are reaching remedial objectives. Many of the remaining sites are those with contamination is present in fractured and weathered bedrock. To help address the challenges present at these sites, the Interstate Technology and Regulatory Council (ITRC) has created Technical and Regulatory Guidance on Characterization and Remediation of Fractured Bedrock sites. This presentation will focus on the latter portion of the ITRC guidance, specifically remedy selection and implementation, as well as remedy operation and monitoring. A companion presentation provides a summary of this initial portion of this guidance document, which focuses on fundamentals of geology, hydrogeology, and the site characterization process.

Approach/Activities.
The ITRC fractured rock guidance is not intended to be a comprehensive “cook book” for characterization and remediation of fractured rock sites, but rather its focus is the primary differences compared to unconsolidated sites. The document begins with a discussion of various geologic terranes, with an emphasis on how this can affect fracture types present at a site. Following the geology discussion, the document presents the fundamentals of groundwater flow and contaminant transport in the rock matrix and in fractures, as well as the role of back diffusion in both sedimentary and igneous/metamorphic rocks. As with past ITRC documents, the fractured rock guidance presents an integrated and iterative process for site characterization and updating the conceptual site model, including a new and improved tools selection matrix.

This presentation will focus on the portion of the guidance that discusses how to evaluate, select, implement, and monitor remediation technologies at fractured rock sites. It will also include an introduction to modeling, highlighting the significant limitations to modeling in bedrock. Finally, the guidance covers regulatory concerns and stakeholder issues. Case studies will be used as examples to illustrate key points.

Results/Lessons Learned. The ITRC’s fractured rock guidance document represents the culmination of decades ITRC experience and collaboration that has tackled some of the most difficult site conditions and recalcitrant contaminants in our industry. The guidance document will be published in the fall of 2017.