



**ITRC Fractured Rock Team Meeting**  
**New Orleans, LA**  
**March 27<sup>th</sup> & 28, 2017**

**Meeting Objectives:**

1. **Resolve outstanding issues from the last team review**
2. **Review the Internet Based Training**

**Team Co-Leaders:** Naji Akladiss – Maine, Michael Smith – Vermont:

**Program Advisor:** Steve Hill, RegTech Inc

**Equipment:** Screen, Flip Charts

**Room:** TBD

**Teleconference:** none

**Monday March 27<sup>th</sup> 2017**

8:00 am	Welcome and review of the meeting agenda <sup>1</sup>	Naji and Michael - Welcome and Introductions Steve – review of the meeting objectives, agenda, and remaining schedule for the project
8:30 am	Significant issues identification <sup>2</sup>	Naji & Michael
<b>10:00 am</b>	<b>Break</b>	
10:15 am	Review and resolve issues in Chapter 1 <sup>3</sup>	Naji, Michael, & Steve
<b>12:00 pm</b>	<b>Lunch on your own</b>	
1:00 pm	Review and resolve issues in Chapter 2 - 4	Naji, Michael, & Steve
<b>3:00 pm</b>	<b>Break</b>	
3:15 pm	Review and resolve issues in Chapter 2 – 4	Naji, Michael, & Steve
<b>5:00 pm</b>	<b>Adjourn</b>	
6:30 pm	Team Dinner TBD	Meet in the lobby

<sup>1</sup> Naji and Michael = Briefly explain the two-day agenda.

<sup>2</sup> Lead a process where team members identify the most significant issues in each chapter and prioritize them for team discussion.

<sup>3</sup> The attending team will review significant errors and omissions, inequities and organizational problem identified during team review. The list of priorities obtained in the previous session will determine which issue/chapters we begin with.



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<b>Tuesday March 28<sup>th</sup> 2017</b>		
8:00 am	Review actions from previous day and any adjustments to todays agenda	Naji, Michael, & Steve
8:30 am	Review Significant Issues Chapter 5 (Developing a CSM)	Naji, Michael, & Steve
<b>10:00 am</b>	<b>Break</b>	
10:15 am	Review Significant Issues Chapter 6 (Technology Selection and Evaluation)	Naji, Michael, & Steve
<b>12:00 pm</b>	<b>Lunch</b>	<b>On your own</b>
1:30 pm	Review Significant Issues Chapter 7, 8, 9, &10	Naji, Michael, & Steve
<b>3:00 pm</b>	<b>Break</b>	
3:15 pm	Subgroup working sessions	All
<b>5:00 pm</b>	<b>Adjourn</b>	

<b>Tuesday March 28<sup>th</sup> 2017 evening- optional</b>		
5:00 pm	Review and revise Internet-based Training	IBT Training team and others who are interested
<b>7:00 pm</b>	<b>Adjourn</b>	<b>All</b>
10:00 am	Dinner on your own	



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The objective of this ITRC document is to provide guidance document that leverages current scientific understanding of fate and transport of contaminants in fractured rock systems to aid in site characterization, development of suitable conceptual site models, and the selection of applicable remedial approaches.

This guidance focuses on applying the current understanding of the fate and transport of known and emerging contaminants in fractured rock environments to improve the development of conceptual site models (CSMs). Additionally this guidance helps the user understand the proper application of conventional and innovative characterization tools and the proper interpretation of the data they will collect.

While understanding the subsurface characteristics and the contaminant phases is critical, selecting and mapping the most appropriate remediation technologies and their temporal application is dependent on the collective knowledge and experience of a remediation design team. Few individuals have the depth of knowledge and experience, in all the necessary disciplines, to adequately design, apply and evaluate remediation systems in fractures rock environments. Well designed and monitored remedial systems unequivocally help stakeholders improve their knowledge and understand the basis for decision making when faced with major decisions regarding remediation.

The Characterization and Remediation of Contaminated Groundwater in Fractured Rock (CRCGFR) document is intended to provide stakeholders and general practitioners with a sufficient foundation to understand the principles of characterizing contaminant releases in simple and complex fractured bedrock settings. Technical Professionals with advanced knowledge and experience with fractured rock characterization including: Project Managers, hydrogeologists, and groundwater environmental engineers, will find this CRCGFR document useful by showing methods to interpret and present the results of a fractured bedrock site investigation by using the current state of the science and by applying concepts in a practical setting. Characterization of contaminated sites requires the skills of these primary data collectors and interpreters advised by a Project Manager who has developed clearly defined goals that range from identification of the fractured bedrock and contamination framework through containment of the contamination to complete remediation of the site. Primary data collectors and interpreters include hydrogeologists, geophysicists, groundwater hydrologist, and other professional staff that are charged with taking primary data such as drillers logs, geologists logs, geophysical logs, water-level data, water-chemistry data, and other site specific and regional data and melding the data with conceptual site model concepts to generate a specific Site Characterization.

The CSM developed by the Technical Professionals, guided by a skilled Project Manager, can then be evaluated by State and Federal Regulators, Stakeholders, Groundwater-Flow and Water-Chemistry Modelers, Remediation and Containment Professionals and Land Owners. Collectively these stakeholders can accept or improve the site characterization based on their collective knowledge base.



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**General Objectives of the Guidance**

- Collect and summarize fundamental background information regarding typical types of fractured bedrock that are encountered and issues of primary and secondary porosity.
- Collect and summarize developing characterization tools and strategies focused on fractured bedrock.
- Evaluate established and emerging contaminants and their varying fate and transport properties as they relate to the challenge of remediation in fractured bedrock.
- Evaluate case studies of successful predictive fate and transport modeling for established and emerging contaminants.
- Evaluate case studies of demonstrated successful application of conventional/innovative remediation technologies (e.g., nanotechnology) for application to fractured bedrock.
- Develop a fractured bedrock characterization tools table to help users select appropriate tools to help better define the contamination Fate and Transport CSM.
- Develop a fractured bedrock remediation technologies table to guide users.