

EXPANDED FIELD TRIP FOR 2009

Improving Hydrogeologic Analysis of Fractured Bedrock Systems

with a Field Trip to the Nevada Test Site and Yucca Mountain

and Second Field Trip to the Lake Mead Fresh Water Intake No. 3 Site

Dates:
March 24-27, 2009

Location:
University of Nevada Las Vegas
and the Nevada Test Site

and the Lake Mead Water
Intake No. 3 Project Site

Instructors:

Ken Bradbury, PhD, PG
Wisconsin Geological and
Natural History Survey

Maureen Muldoon, PhD, PG
University of Wisconsin, Oshkosh

Glenn Duffield
HydroSOLVE, Inc., Author of AQTESOLV

Chris Mulry, PG
GES, Inc.

Dan Kelleher, PG
Midwest GeoSciences Group

Recent advances are rapidly improving our understanding and conceptualization of fractured bedrock systems. Environmental sites in fractured bedrock systems have been perceived as so inherently complex that unmanageable uncertainty remains even after an investigation was complete. Today, we are gaining insight into hydrogeological relationships and taking steps to further characterize the nature of fate and transport of contaminants in fractured bedrock.

Numerical modeling advances are continuing, too. Groundwater, solute transport and fracture simulation modeling is capable of more while becoming easier to use.

This intensive course is dedicated to hydrogeologic analysis of environmental and engineering sites underlain by complex fractured bedrock systems and the recent advances that are occurring from field investigations to comprehensive characterization.

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Photo courtesy of the Yucca Mountain Project

This is a highly practical course in fractured rock. I attended this course prior to beginning a large investigation at a site situated in a complex fractured rock setting. The course was an invaluable aid in planning the design of the components of the intrusive investigation and analysis of the field data. This is the most up to date and functional course that I have attended in years.

- S.C. Blauvelt, P.G., Vice President & Director of Regional Operations, Penn E&R, Inc.

Learn Recent Advances in Hydrogeologic Characterization of Bedrock

- Learn new field techniques for characterizing fracture networks and ground water movement
- Understand rock discontinuities and the nature of fracture flow
- Practice rock core logging for hydrogeologic projects
- Integrate rock stratigraphy into conceptual models and appropriate ground water models
- Learn to develop and integrate dual porosity and discrete fracture conceptual models
- Discover recent advances of surface and borehole geophysics, including dynamic flowmeter test
- Find out how to design and execute tracer tests, single well and packer tests and pumping tests
- Practice preparing potentiometric surface and water table maps using modern principles
- Recognize the do's and don'ts of ground water flow and transport modeling of fractured systems

World class workshop with a field trip of a lifetime.

- Jeff Ogden, P.G., Fehr Graham and Associates, Inc..

Two Exclusive Field Trips in 2009

Yucca Mountain and the Nevada Test Site

Once arriving at the Nevada Test Site, participants have exclusive access inside the proposed repository tunnel and learn recent updates about the Yucca Mountain Project. Participants enter the tunnel and learn about the project's fracture mapping and modeling program. Participants also observe the Tunnel Boring Machine, important geological features, sample management facility and this year the trip includes a tour across the numerous subsidence craters from underground atomic testing.

An exciting benefit to this course is the field trip to Yucca Mountain, an unequalled opportunity to visit a site where the fracture system has been mapped to precise detail and the hydrogeologic testing has been put to the most thorough analysis.

Lake Mead Fresh Water Intake No. 3

Lake Mead water levels have declined so low that it threatens to dip below the water intake pipes located near the shoreline. Looking forward, the South Nevada Water Authority has initiated a historic tunneling project where a third water intake can extract water from greater depths in Lake Mead. The new (No. 3) fresh water intake will be constructed using a tunnel boring machine that advances from offshore to underneath the lake targeting the deepest portion. This is a truly historic engineering project.

This year, the course includes a fifth day (Saturday, March 28) where participants will gain exclusive access to this historic project site including non-public areas inside Hoover Dam. Details about the Lake Mead Intake No. 3 Project Tour are forthcoming.

U.S. Department of Energy requires that participants attending the Field Trip register before March 16, 2009 and Non-US Citizens register before February 8, 2008 for obtaining Federal approval before entering the Nevada Test Site. Midwest GeoSciences Group is not responsible for administering access approval or security clearances.



CEUs by UNLV
(32.0 Contact Hours)

REGISTRATION

Improving Hydrogeologic Analysis of Fractured Bedrock Systems
March 24-27, 2009

Last Name: _____ First Name: _____
 Position: _____
 Company: _____
 Address: _____
 City, State, Zip: _____
 Phone: _____
 Email: _____

*For early registration, payment must be received before 03/16/09. Cancellations may be made up to 03/16/09, however 25% of the fee will be charged. No refunds. Registration and cancellation policies at: www.midwestgeo.com. Or call Customer Service at 763.607.0092 or email info@midwestgeo.com.

Course Fee: Register Now \$1,395
 After March 16 \$1,595

Check Enclosed
 VISA MasterCard AMEX

VISA / MC / AMEX NUMBER _____ EXP _____
 CARDHOLDER NAME _____

Purchase Order _____

Mail completed form with payment to:
 Midwest GeoSciences Group
 6771 County Road 8 SW
 Waverly, Minnesota, USA 55390
 Or Register On-Line: www.midwestgeo.com

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and Second Field Trip to the Lake Mead Fresh Water Intake No. 3 Site

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6771 County Road 8 SW
Waverly, Minnesota 55390



Photos courtesy
of the Yucca Mountain Project

March 24-27, 2009

Quotes from past participants:

"A fantastic mix of knowledgeable and enthusiastic instructors, up-to-date and expansive course materials, and one spectacular field trip made this by far the best course I have attended.

- Kathleen T. Soukup, Weston Solutions, Inc.

"This course is an excellent overview of fracture flow coupled with new concepts of contaminant and fluid flow in fractured media. Not only does the course explain porosity & permeability of fractured settings, but it presents useful modeling approaches for fractured scenarios too. The instructors are terrific and highly knowledgeable in their field of study. The field trip to Yucca Mountain was the highlight of the course. I would recommend this course to anyone working with groundwater, ranging from contaminant assessments to water supply"

- Christine Bucklin, California Department of Toxic Substances Control



CEUs by UNLV
(32.0 Contact Hours)

"This is an excellent course with highly qualified instructors, up-to-date course material on fractured rock hydrogeology, and an outstanding field trip inside Yucca Mountain. I highly recommend (this course) to any geologist, environmental scientist, and engineer."

-Scott Shelton, City of Boston

Registration

Advance registration is necessary in this limited-enrollment workshop to reserve space and receive course materials. A confirmation letter and map will be sent within 10 days of registering for the course.

U.S. Department of Energy requires that US Citizens attending the Field Trip register before March 10, 2009 and Non-US Citizens register before February 8, 2009 and obtain Federal approval before entering the Nevada Test Site. Midwest GeoScience Group is not responsible for administering access approval or security clearances.

Registration is accepted on a first come, first served basis. A minimum of 25 people must be registered by February 24th to conduct this course. (normally reaches max. capacity) Midwest GeoSciences Group is not responsible for registrant's airfare, hotel, rental car reservations or other ticketing.

Special arrangements for diet, equipment, or handicap facilities should be indicated when registering for the course. Complete course details and a registration form is available on-line at midwestgeo.com

Group Discounts

A group discount of 20% may be applied when five or more people from the same company register at the same time during the early registration period.



The "Core" Group

Past course attendees are pictured with the Tunnel Boring Machine that excavated over six miles of rock tunnel at Yucca Mountain. A visit to the TBM is part of the tunnel tour at the Nevada Test Site coupled with the mountain crest, geologic exposures, the Sample Management Facility.

Photo gallery for past trips are at www.midwestgeo.com

What You Will Receive

You will receive 32.0 contact hours of instruction, a Course Notebook, CEU completion certificate from the University of Nevada Las Vegas, and a *Field Guide for Rock Core Logging and Fracture Analysis*. This course also includes continental breakfast, morning coffee break, lunch, and an afternoon break. You are welcome to take photos during the workshop exercises and the Yucca Mountain Tunnel field trip. Recording devices are not permitted during classroom sessions.

The Yucca Mountain tour is anticipated to last approximately 12 hours. Attendees will board a motor coach in Las Vegas, receive tunnel safety training, tour several locations of the Yucca Mountain Project, and return to pick up location.

PLEASE NOTE: U.S. Department of Energy and Yucca Mountain Project staff reserve the right to change any part of the field trip itinerary at any time.

Level of Difficulty

This course begins with a brief overview of hydrogeologic principles for fractured bedrock and continues at an advanced level throughout the course to match the range of conditions typically encountered during field investigations.

What to Bring

Bring a calculator, clipboard, and any rock core forms that you normally use for description and characterization. You are also encouraged to bring your own project results for course discussion.

Hard hats and safety glasses will be available for the tunnel tour. Steel toe shoes are not required, but hard soled shoes are

Continuing Education Units

Continuing Education Units (CEUs) and Course Completion Certificate will be administered by the University of Nevada Las Vegas. Thirty-two contact hours will be awarded, thus 3.2 CEUs. The following programs have pre-authorized this course and CEUs:

- ◆ Massachusetts Licensed Site Professionals
- ◆ Connecticut Licensed Environmental Professionals
- ◆ Texas Corrective Action Project Managers
- ◆ Oklahoma UST Consultants

Cancellation Policy

Cancellations may be made up to two weeks before the course, however, 25 percent of the course fee will be charged. Cancellations made after two weeks before the course will be charged \$500. No refunds. One substitute is allowed for each registrant who is unable to attend.

Accommodations

We chose the Candlewood Suites as accommodations for our guests because of the spacious studio and one-bedroom suites coupled with it's proximity to UNLV. We appreciate the non-gaming hotel environment, but take advantage of the short taxi ride to the Las Vegas Strip.

You are invited to the Candlewood Suites where you can enjoy executive desks, high speed internet, in-room DVD player and free movies. We will be hosting a poolside reception at the end of the first day (Mar 25) for those staying at the Candlewood Suites.

The motor coach departs for Yucca Mountain at 6am from the parking lot of the Candlewood Suites on Day Two.

A block of rooms is reserved at the Candlewood Suites at the guaranteed rate of \$129/night for a studio room or \$169/night for a one-bedroom studio.



Candlewood Suites
4034 Paradise Road
Las Vegas, Nevada 89169 USA
Phone: 1-702.836.3660

Ask for Martin and mention the Midwest GeoSciences Group course at UNLV for the great room rates.