

# Advanced Aquifer Testing Techniques

Featuring **AQTESOLV™** and the **In-Situ Level TROLL®**

**June 19-21, 2013**  
**Calgary, Alberta**

**Jim Butler, PhD, PG**

Kansas Geological Survey and  
Past NGWA Darcy Lecturer

**Glenn Duffield**

HydroSOLVE, Inc. and  
Author of AQTESOLV

Featuring Guest Instructor:

**Shlomo P. Neuman, PhD**

University of Arizona

**Jim Butler** is author of "The Design, Performance, and Analysis of Slug Tests" (Lewis Pub., 1998) and the 2007 National Ground Water Association Distinguished Darcy Lecturer. For the last 26 years, he has worked as a research scientist at the Kansas Geological Survey. He holds a M.S. and Ph.D. in Applied Hydrogeology from Stanford University. Jim also serves as a consulting hydrogeologist and is currently an associate editor of the journal of Ground Water.

**Glenn Duffield** is a hydrogeologist and the president of HydroSOLVE, Inc., with over 25 years of consulting experience in groundwater flow and transport modeling, software development and aquifer test analysis. He is currently an associate editor of Ground Water and the author of AQTESOLV, which for over 23 years has been the world's leading software for the analysis of aquifer tests.

**Shlomo P. Neuman** is Regents' Professor of Hydrology and Water Resources at the University of Arizona. Among his many accomplishments and countless reference publications, Dr. Neuman has made seminal contributions to the area of pumping test design and analysis including the theory of flow in multiaquifer systems, estimation of aquitard properties and flow in unconfined aquifers.

**midwest  
GEOSCIENCES**  
www.midwestgeo.com **group**

in collaboration with

**Aquatic Life®**  
Ltd.

Conducting aquifer tests in complex hydrogeologic settings such as heterogeneous or fractured media is a key element to site characterization, water resources assessment and remediation system design. However poorly planned aquifer testing programs often lead to suspect data or unanswered questions after the field work is complete. Even when you are confident of the geologic conditions, you may have difficulty designing effective aquifer tests, running field equipment or selecting the best available model to analyze the test data. Where can you turn to improve your approach and skills for aquifer testing?

Midwest GeoSciences Group can help! We have designed a powerful three-day training course on aquifer testing design, field methods and data analysis techniques featuring AQTESOLV. This course will provide you with the knowledge to master aquifer testing from beginning to end. Gain an advantage by learning up-to-date methods and procedures for designing, conducting and analyzing aquifer tests.

Dr. Neuman will teach state-of-the-art methods for the analysis of pumping tests in unconfined and multiaquifer systems. He will discuss his landmark contribution to the estimation of aquitard properties using the Neuman-Witherspoon ratio method and his recent groundbreaking work on 3D saturated-unsaturated flow in unconfined aquifers.

### Master State-of-the-Art Field and Analysis Procedures

- Learn to design the most effective aquifer test programs for a wide range of geologic conditions (including low permeability confining units and fractured bedrock)
- Gain an advantage during your next aquifer test by mastering new field and data analysis procedures
- Find out how to differentiate laterally extensive sands from isolated sand bodies
- Discover new techniques for anticipating and resolving problems that may arise in aquifer tests
- Obtain step-by-step instruction for field screening using AQTESOLV computerized analysis

### Learn Up-To-Date Slug Testing Procedures

- Learn to select and apply appropriate slug test models for different hydrogeologic settings and well configurations
- Maximize results from tests conducted in wells screened across the water table
- Find out how to recognize and account for the effects of noninstantaneous (noisy) test initiation and wellbore skin
- Discover the latest strategies for designing, conducting and analyzing tests in high-K media including oscillatory responses
- Gain knowledge of new approaches for decreasing test duration in low-K media

### Discover Recent Advances in Pumping Test Methods

- Learn to design, conduct and analyze pumping tests in confined, leaky, unconfined and fractured aquifers
- Master strategies for dealing with variable pumping rates, wellbore storage, partial penetration, well losses, wellbore skin and other common issues
- Discover diagnostic methods including derivative analysis that help you select appropriate pumping test models
- Gain an advantage by applying Agarwal's method for analysis of recovery data
- Find out the best procedures for monitoring a pumping test with the In-Situ, Inc. Level TROLL
- Master tips and tricks for using AQTESOLV to analyze constant-rate, step-drawdown and recovery tests

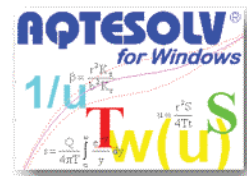


**COLORADO SCHOOL OF MINES**

24 Contact Hours  
(2.4 CEUs)

### BRING YOUR COMPUTER

Analyze data from a variety of hydrogeologic conditions and well configurations using AQTESOLV. Participants may bring their own project data for analysis for QA/QC by the instructors.



Advanced registration is necessary for participation in this limited-enrollment short course. Pre-registration is required to reserve space and receive course materials. A confirmation letter and map will be sent within 10 days following your course registration.

Accommodations at Holiday Inn Macleod Trail Calgary for \$149.00 CDN plus Taxes  
Phone: 1-866-554-0162 ask for block of rooms for Midwest GeoSciences Group.

### REGISTRATION

**Advanced Aquifer Testing Techniques**  
Featuring AQTESOLV and the In-Situ LEVEL TROLL  
19-21 June 2013

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Position: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Postal Code: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

### Course Fee:

Register Now..... \$1,195 CND

After June 11..... \$1,395 CND

Canadian Residents add GST of 5%

**Mail completed form with payment to:**  
Aquatic Life Ltd.  
PO Box 39  
Pinawa, MB Canada ROE 1L0

**Or On-Line:** www.midwestgeo.com

Check Enclosed

VISA  MasterCard

\_\_\_\_\_

VISA / MC NUMBER

\_\_\_\_\_

CARDHOLDER NAME

Purchase Order \_\_\_\_\_

\*For early registration, payment must be received before June 11, 2013. Cancellations may be made up to June 5th, however 35% of the fee will be charged. No refunds. Maximum number of 40 registrations for this course. Payments processed by Aquatic Life Ltd. Course location is the KANANASKIS CONFERENCE ROOM at the Holiday Inn Macleod Trail South, 4206 Macleod Trail, Calgary, AB T2G 2R7. Questions? Call Customer Service at 763.607.0092 or email [service@midwestgeo.com](mailto:service@midwestgeo.com).