



# PROGRAM



## 2008 PENNSYLVANIA GROUND WATER INSTITUTE FOR TEACHERS™

*Breinigsville, Pennsylvania – October 21-22, 2008*

Convened by the  
*American Ground Water Trust in partnership with the US Geological Survey*

Hosted at:  
*Nestlé Waters Deer Park Facility, 405 Nestlé Way, Breinigsville, PA*

***The American Ground Water Trust Thanks the following  
Institute Program Donors for their generous funding support!***

Nestlé Waters North America, Breinigsville, PA  
Schramm, Inc. West Chester, PA  
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Miller Brothers Construction, Inc., Schuylkill, PA

### Invited Speakers and Topics

**TUESDAY OCTOBER 21, 2008**

**8:00am - 9:00am**                      **Registration (Coffee and Danish)**

**9:00am – 10:00am**                      **Class Session**

*Garret Graaskamp, Hydrogeologist, American Ground Water Trust, Concord, NH*

#### **Ground Water Fundamentals**

- Overview of the hydrologic system and the geologic environments that influence the nature and occurrence of ground water

**10:00am - 10:15am**                      **Networking Session**

**10:15am – 11:15am**                      **Class Session**

*Dennis Risser, Hydrologist, United States Geological Survey, New Cumberland, PA*

#### **The Geology and Aquifers of Pennsylvania**

- Where is the State's ground water?
- How to choose a drilling site for a well
- How do aquifers, springs and natural ground water systems work?
- Summary of potential threats to ground water quality

# 2008 Pennsylvania Institute Program

**TUESDAY OCTOBER 21, 2008 (CONTINUED)**

**11:15am – 12:00 noon      Class Session**

*Joel Jordan, Source Water Protection Specialist, PA Rural Water Association, Bellefonte, PA*

- Ground Water Model Demonstration

**12:00 noon – 1:00pm**

**Lunch – Provided Courtesy of Nestlé Waters**

**1:00pm - 2:15pm      Class Session**

*Eric Andreus, Natural Resource Manager /Hydrogeologist Nestlé Waters, Breinigsville, PA*

**From Spring to Bottle – Tour of Nestlé Waters Bottling Plant Process**

**2:15 – 2:30pm**

**Networking Break**

**2:30pm – 4:30pm**

**Class Session, Activities and Demonstrations**

*Pamela Kistler, Ph.D., Chairman, Chemistry Department, Cedar Crest College, Allentown, PA*

**The Chemistry of Ground Water - What is Water?**

- The basic chemistry of natural ground and surface water – Are they the same?
  - Is a “polar molecule” only found at the North Pole?
  - How and why do substances dissolve in water?
  - Does the chemistry of a water droplet change as the temperature decreases?
  - Does water have a role in the processes of adsorption and absorption?
  - How can an insoluble compound (gasoline or dry cleaning fluid) be a water contaminant?
  - Analysis of selected water samples

# 2008 Pennsylvania Institute Program

WEDNESDAY OCTOBER 22, 2008

**8:15 am**

## **Institute Reconvenes**

Location: Nestlé Waters Deer Park Facility, 405 Nestlé Way, Breinigsville

**8:30am - 9:30am**

## **Class Session**

*David Farrington, President, Brickhouse Environmental, West Chester, PA*

*Doug Schott, Senior Geologist, Brickhouse Environmental, West Chester, PA*

### **Karst Geology and Ground Water Occurrence in Pennsylvania**

- What is karst and how does it form?
- The hydrogeology of a karst terrain
- Development concerns in karst areas
- How is ground water contamination investigated in a karst environment?
- Karst investigations - Project work “to ‘dye’ for”

**9:30 – 9:45am**

## **Networking Break**

**9:45am – 11:00am**

## **Class Session**

*Michael Gooseff, Associate Professor, Pennsylvania State University, University Park, PA*

### **Tales of scales: Characterizing groundwater-stream water interactions**

- What conditions control the exchange between Surface Water and Ground Water?
- What chemical changes occur during the exchange (Temperature, DO, Salinity, etc.)?
- How big is the exchange zone (How is the zone defined)?
- How does flooding (drought) affect the interaction rates and zone area?

**11:00am – 12:00pm**

## **Class Session**

*Duane LeBoeuf, Field Services Engineer, Franklin Electric, Jamison, PA*

### **How does a Water Pump Work?**

- Is a pump different from a “straw?” How a pump works.
- A pump is a pump is a pump: True or False
- What type of pump works best down in a well?
- What is a pressure tank and how does it work?
- Constant Pressure Pumps and the “Laws of Affinity”

**12:00 noon – 1:00pm**

**Lunch – Provided Courtesy of Nestlé Waters**

# 2008 Pennsylvania Institute Program

WEDNESDAY OCTOBER 22, 2008 (continued)

**1:00pm - 2:00pm**                      **Class Session**

*Todd Giddings Ph.D, P.G., Todd Giddings and Associates, Inc., State College, PA*

**Geothermal Heat Pump Systems**

- How do geothermal heat pumps work?
- How can cold ground water heat my house or school?
- Why are geothermal heat pumps so efficient?
- Can I retrofit a geothermal system to my home?
- Case history examples of residential, commercial, and school systems

**2:00pm – 5:00pm**                      **Field Trips – *Carpool to the following sites:***

- 1) Fogelsville Flooded Quarry Site**
- 2) Nestlé Waters - Hoffman Spring**

- 1) *Liesel Adam, Water Education Specialist, Lehigh County Authority, Allentown, PA*
  - Historical perspective of quarries in Pennsylvania and their impact on groundwater
  - Description of geology and other features of the quarry
  - Is the quarry a discharge or recharge area for ground water?
  - Evaluation of historical groundwater levels in Lehigh County
  - Visual assessment of the effect of drought on ground water levels
- 2) *Eric Andreus, Natural Resource Manager /Hydrogeologist Nestlé Waters, Breinigsville, PA*
  - What is “Spring Water?”
  - The geology of the Hoffman Spring
  - History of the Hoffman Spring
  - What is the “safe yield” for the spring resource and how is it determined?
  - How is the source area of the spring defined?
  - How is the quality of the spring water protected?

**5:00 pm Institute Adjourns at Nestlé Waters Deer Park Facility, 405 Nestlé Way, Breinigsville**