

# PROGRAM

## GEOHERMAL HEATING AND COOLING INNOVATIONS: DESIGN, FINANCING AND REGULATION

Location: DoubleTree Inn, 5485 Twin Knolls Road, Columbia, MD 21045  
Date: Tuesday, March 5, 2013  
Time: 8:00am to 4:45pm

Convened by the:  
**American Ground Water Trust**  
Concord, NH  
501(c)(3) Education Organization



## EVENT SPONSORS



### In cooperation with:

Alice Ferguson Foundation  
b2E Consulting Engineers  
Baroid IDP  
Bowman Geothermal  
EnergyWise Partners

Gipe Associates  
International Ground Source Heat Pump Assoc.  
Jack Neil & Associates  
Maryland Energy Administration



### CONTINUING EDUCATION



**Certificate of Attendance:** (Contact Hours: 7.25) will be provided to those attendees who sign-in and sign-out. These certificates may be used by attendees to obtain continuing education credit from professional organizations or licensing agencies. Attendance Certificates will be mailed after the event. (Sign-in, sign-out required)

### CONTINUING EDUCATION CREDITS

Architect Credits – 7.25 LUs (FOR HSW), AMERICAN INSTITUTE OF ARCHITECTS (PROVIDER G521)  
Maryland Architects – 7.25 CEUs, MARYLAND BOARD OF ARCHITECTS,  
Maryland Water Well Contractors – 7.25 CE Hrs, MD DEPT OF ENVIRONMENT; BRD OF WELL DRILLERS  
IGSHPA Accredited Installers – 0.75 CEU's

At the end of the program please leave your badge holders and evaluation forms on the table. – Thanks!

# PROGRAM

**7:30am – 8:00 Registration (Coffee and Donuts)**

**8:00am – 8:35 Resource Sustainability and Geothermal Heating and Cooling Concepts**

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

- Water and Energy – The Sustainability Nexus
- Geothermal Heating and Cooling Fundamentals
- Installations to ensure Groundwater Protection

**8:35am – 9:15 Status of the Geothermal Industry**

**Scott Emery PE**, Director, Bowman Geothermal, Manassas, VA

- Geographic distribution of geothermal installations
- Trends in the growth of geothermal applications
- Market potential and market predictions for the geothermal industry
- How the Geothermal industry is organized nationally, regionally and locally
- What appear to be the barriers to greater acceptance of geothermal installations?

**9:15am – 9:55 Maryland’s Renewable Portfolio Standard (RPS) –  
Getting Geothermal Heating and Cooling Installations into the Mix**

**Doug Hinrichs**, Solar & Geothermal Program Mgr, Maryland Energy Administration, Annapolis, MD

**Jack Neil**, President, Jack Neil & Associates, Annapolis, MD

- Status of implementing bills S.B. 652 and H.B. 1186
- Who is eligible to apply for geothermal heating and cooling Renewable Energy Credits (RECs)?
- How are RECs generated and accounted for with geothermal heating and cooling?
- What geothermal heating and cooling projects qualify for RECs?
- What is the compliance period for a geothermal heating and cooling derived REC?
- How and when can a geothermal-derived REC be renewed?

**9:55am – 10:10 Networking Break**

**10:10am – 10:50 Financing Innovations for Geothermal Installations**

**David Neale**, VP of Marketing and Business Development, EnergyWise Partners LLC. Rochester, NY

- What is a GHP HVAC system financing-entity ownership model?
- System Leasing versus Thermal Purchase Agreements
- What type of energy monitoring is needed to document BTU usage?
- How does monitoring enhance system support and warranty?
- Can this model be retrofitted to existing installations?
- How does the financing-entity method work to increase GHP HVAC system sales?

**10:50am – 11:30 More than a “hole in the ground”- Drilling techniques - Logistics and Grout**

**Dennis Duty**, Senior Field Services Technical Representative, Baroid IDP, Buckingham, VA

- Criteria for selecting a drilling contractor for geothermal projects
- Matching the drilling equipment and drilling methods to the geological and site conditions
- Geothermal Design – What geologic data is needed – what is not?
- Installing the vertical loop into the drilled bore – Do’s and Don’ts that cost money
- Grouting material properties and options for geothermal projects
- Techniques of grout placement to meet geothermal design specifications

**11:30am – 12:00 Formation Thermal Conductivity Tests – How they Reduce Initial and Operational Costs**

**Larry Caruthers**, Project Manager, Bowman Geothermal, Manassas, VA

- What is a Formation Thermal Conductivity test?
- Why should a FTC test be included in the Scope of Work?
- When should a FTC be completed?
- Who should conduct the FTC to avoid conflicts?
- Where should the FTC boring(s) be located?

**12:00pm – 12:50 Lunch (Provided on Site)**

# PROGRAM (Continued)

## 12:50pm – 1:10 Update on New Regulations Affecting Vertical Loop Installations

**John Boris**, Geologist, Program Consultant, Maryland Dept of Environment, Baltimore, MD

- Grout mixture specifications
- Grouting procedure requirements
- Permit requirements

## 1:10pm – 1:50 Hybrid systems - Innovative GHP/GHEX System Design

**Gene Slavens**, Geothermal Development Manager, ClimateMaster, Oklahoma City, OK

- Advantages of hybrid for summer and winter demands
- Costs and life-cycle benefits
- Tax incentives and cost benefits of hybrid systems
- Case study example of a 750 ton installation
- Design Comparison of GHPs v. Variable Speed compressor Air-to-Air HPs

## 1:50pm – 2:30 Designing Ground Loop Fields for HVAC Systems - Pump Energy Optimization Using Variable Frequency Drives

**Bruce Beddow, PE, CEM, GBD**, Principal, b2E Consulting Engineers, Leesburg, VA

- Ground Loop Heat Exchanger System Software – Loop Sizing Considerations
- System Piping Arrangements – Do's and Don'ts
- System Balancing and Important Decisions
- Equipment Selection – HVAC System Type and Integration
- Energy Management System Controls - Interface and Operational Considerations
- Planning for System Flushing and Purging

## 2:30pm – 3:10 Net-Zero Design Principles

**David Hoffman, PE, LEED AP**, Senior Vice President, Gipe Associates, Inc., Easton, MD

- How is Net-Zero defined: cost, emissions, site, source
- Why are GHPs the best HVAC system choice for a Net-Zero building?
- Design concepts that optimize Geothermal Heat Pumps with Solar Thermal and PV
- Energy Demand Reduction Strategies and Management Systems

## 3:10pm – 3:25 Networking Break

## 3:25pm – 4:05 Commissioning a GHP System – Missing the Last Step Costs Money

**David Hoffman, PE, LEED AP**, Senior Vice President, Gipe Associates, Inc., Easton, MD

- How is a GHP HVAC system “Commissioned?”
- Design and Installation Mistakes – Where do they hide?
- What observations and measurements cannot be overlooked?

## 4:05 – 4:45 Living Building Challenge - Using Geothermal Heat Pumps to Reach Net-Zero

**Sandy Wiggins, LEED AP**, Principal, Consilience, Washington DC

- Net-Zero System - Hard Bargain Farm Environmental Center (Alice Ferguson Foundation), Accokeek, MD

## 4:45 pm Wrap-up and Adjourn

- Further Questions and CEU sign-out

## AMERICAN GROUND WATER TRUST

The *American Ground Water Trust* is a non-profit organization that promotes awareness, cooperation and action among individuals, groups and organizations. It has the core mission of promoting “science as the basis for water policy.” Specifically, the AGWT’s conference and workshop programs and educational materials:

- ◆ Promoting efficient and effective ground water management
- ◆ Communicating the environmental and economic value of ground water
- ◆ Showcasing ground water science and technology solutions
- ◆ Increasing citizen, community and decision-maker awareness
- ◆ Facilitating stakeholder participation in water resource decisions

