

**- GEOTHERMAL EDUCATION -
USING THE EARTH'S RENEWABLE ENERGY
GROUND SOURCE HEATING & COOLING FOR
RESIDENTIAL AND COMMERCIAL PROPERTIES
Latest Technologies, Economic Advantages, Environmental Impacts and Regulations**

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Thursday, February 17, 2011 ~ 8:00 am - 4:45 pm

at the

Holiday Inn Brownstone Hotel & Conf. Ctr., 1707 Hillsborough St., Raleigh, NC ~ Hotel Telephone: 919-828-0811

Presented by

American Ground Water Trust
Ground Water Education Programs Since 1986
50 Pleasant Street, Suite 2, Concord, NH 03301-4073



THANK YOU TO OUR SPONSORS:



In cooperation with

*Geothermal Heat Pump Consortium
International Ground Source Heat Pump Association*



CONTINUING EDUCATION CREDITS AVAILABLE

ARCHITECT CREDITS - 7.25 LUS (FOR HSW AND SUSTAINABLE DEVELOPMENT) THROUGH THE AIA (PROVIDER #521)
AMERICAN SOCIETY OF HOME INSPECTORS - 7.0 ASHI® CE CREDITS
IGSHPA ACCREDITED INSTALLERS - 0.75 CEUS
NORTH CAROLINA WATER WELL DRILLERS - 7.5 PDH THROUGH THE NORTH CAROLINA DENC

WHO SHOULD ATTEND ?

This program will be of interest to end users and professionals who design, install, inspect, approve, recommend or regulate geothermal systems. This technology is becoming the technology of choice among those considering “green energy” alternatives for commercial or residential installations.

Energy company engineers, architects, planners and conservation commissioners, building code inspectors, environmental health professionals, home inspectors, water well contractors, HVAC professionals, real estate agents, home builders and developers, town officials (Conservation, Zoning, Planning), water testing specialists should not miss this opportunity to get up to speed with this technology. It will be coming to a building near you!

WHAT IS IT ALL ABOUT ?

Today's ground source heating and cooling (GSHC) technology provides a proven method for saving significant amounts of energy for heating, cooling and hot water generation for ANY application. Thousands of homes, businesses and manufacturing plants across the nation are already taking advantage of these energy-efficient conditioning systems. GSHC systems operate at significantly lower costs than traditional gas, oil or electric-based installations. National benefits from geexchange installations include less demand for energy generation capacity, reduction in green-house gas emissions and a reduced dependence on imports of oil and other fossil fuels.

(continued inside)

GEOTHERMAL - WHAT IS IT ALL ABOUT ?

(continued from front page)

By definition, installation of ground source systems involves accessing the sub-surface by either excavation or by drilling vertical bores. Because the sub-surface heat-exchange process occurs near or beneath the ground water table, environmental and water resource questions about design and installation are of a concern to state regulatory agencies.

This one-day program will:

- Define the “state of the art” in terms of design options and economic pay-back
- Demonstrate the environmental and strategic benefits of the technology
- Dispel common myths about the effectiveness, reliability and safety of ground source systems
- Explain industry-accepted installation, operation and maintenance practices
- Provide an update on state, local and regulatory oversight recommendations

Questions to be considered include:

- Are there any environmental or economic risks associated with this technology?
- Are there data that clearly demonstrate risk cause and effect?
- Do design and installation standards provide adequate environmental protection?
- Should specific professional training be required for the below-ground system installation?
- Which agencies should, or do, have, regulatory oversight for heat exchange installations?
- What are the barriers to widespread adoption of the technology for new buildings or for homeowner retrofit? What can be done to eliminate these barriers?

The Forum program draws on the experience & expertise of industry and agency professionals and will provide a unique opportunity for exchange of information among policy makers involved in energy issues and specialists involved with the design, construction and permitting of ground source geoechange systems for cooling and heating.

GEOTHERMAL - FORUM PROGRAM

- 7:15 - 8:00 am** **REGISTRATION / EXHIBITS / CEU Sign-In (Coffee and donuts provided)**
- 8:00 – 8:20** **INTRODUCTION**
Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH
- Concept of resource sustainability
 - Ground Water and Geologic Considerations
 - Objectives of the GHPsRUS Initiative
- 8:20 – 8:50** **STATE ENERGY INITIATIVES – GROUND SOURCE ENERGY OVERVIEW**
Ward Lenz, Director - Energy Division, NC Department of Commerce, Raleigh, NC
- Overview of North Carolina Energy Initiatives
 - North Carolina’s economic perspective of reducing electrical energy demands and the need for infrastructure investment
 - Potential impact of geoechange technology on North Carolina’s energy security
 - Ground Source technology impact on North Carolina’s efforts to reduce CO2 emissions
- 8:50 – 9:40** **THE STATUS OF THE GEOTHERMAL INDUSTRY**
Mike Murphy, Southeast Region Residential Manager, ClimateMaster, Saint Simon Island, GA
- Geographic distribution of geothermal installations, nationally and in North Carolina
 - 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?
- 9:40 – 9:55** **BREAK**
- 9:55 – 10:45** **GROUND SOURCE EARTH COUPLING DESIGN PRINCIPLES**
Tate Rust, Territory Manger, WaterFurnace International, Charlotte, NC
- Explanation of the methods: Closed loop – vertical, horizontal (slinky); Open system – to surface, to diffusion; and Heat exchanger systems for surface water (ponds and lakes)
 - Weighing positives and negative aspects of each earth coupling method
 - Design considerations for geothermal wells in bedrock vs. shallow sand & gravel wells
 - What makes one well more efficient than another for thermal transfer?
 - Common misconceptions about the geothermal earth coupling
- 10:45– 11:45** **GROUND SOURCE HEAT PUMPS - THE FUNDAMENTALS**
Chuck Hammock, Principal, Andrews, Hammock & Powell, Inc, Macon, GA
- Understanding the basic physics of the heat transfer process
 - Explanation of terminology (geoechange, geothermal, ground source, BTUs, tons etc.)
 - How the heat exchange process works for heating and cooling
 - What happens to the heat transferred underground – are there any risks?
 - How to measure the efficiency of geothermal systems
 - Primary differences between geothermal and traditional HVAC applications
 - What should a home inspector, Realtor or prospective purchaser look for?
 - Application of ground source heating and cooling systems in North Carolina

GEOTHERMAL - FORUM PROGRAM (continued)

11:45 – 12:45 pm LUNCH (Provided on site) / EXHIBITS OPEN

12:45 – 1:25 GEOEXCHANGE WELL / BORE CONSTRUCTION

Mark Whittle, Senior Field Services Technical Representative, Baroid IDP, Lexington, SC

- How a ground source heat pump boring differs from a water well
- Basic difference between drilling fluids and sealing grouts
- Matching the drilling technology to the geological conditions
- Managing drilling fluids to optimize vertical penetration rates
- Collecting geologic & water quality information for the geothermal designer
- Dual purpose (water supply and geothermal) wells
- Techniques of grout placement to meet geothermal design specifications

1:25 – 2:10 PROPERTIES OF GROUTS FORMULATED FOR GEOTHERMAL HEAT PUMP APPLICATIONS

Alan Skouby, Vice-President, GeoPro, Inc., Bowie, TX

- Regulatory and thermodynamic reasons for grouting
- Grouting material options for geothermal projects
- Heat-exchange physics of thermally-enhanced grouts
- How correct grout selection impacts operational economics
- Verification of geothermal grouting material performance

2:10 – 2:50 ECONOMIC SUCCESS STORIES – THE PAYBACK - Residential, Commercial and Industrial
To Be Announced

- How to do the short-term and long-term math on energy saving vs. installation cost?
- What is the typical payback period and Return on investment (ROI)?
- How do geothermal installations add equity value to a property?
- What are the typical servicing and maintenance needs and costs for a geothermal system?
- What is the Utility perspective on the use of GSHPs?

2:50 – 3:05 BREAK

3:05 – 3:50 GEOEXCHANGE SYSTEM INSTALLATIONS - The LEED Perspective

Matt Parker, Senior Associate, Stantec, Raleigh, NC

- What is Leadership in Energy and Environmental Design (LEED)?
- Overview of the various Green Building rating systems: United States Green Building Council (USGBC)
- Overview of the LEED rating systems - Commercial vs. Residential
- How is a building's heating and cooling system (energy-use) evaluated in the LEED rating system?
- How do Ground Source Heating and Cooling systems achieve LEED rating points?

3:50 – 4:30 GEOEXCHANGE INSTALLATIONS: STATE and LOCAL RULES and REGULATIONS

Michael Rogers, Environmental Specialist, NC Div of Water Quality, Raleigh, NC

- Health concerns from installation and/ or operation of geothermal systems
- Environmental & water resources concerns from drilling, heat exchange or well failure
- Current regulatory requirements in North Carolina
- "Paperwork" burden for installation of a geothermal system
- Perception of "risks" to the integrity of ground water or aquatic environments
- In what instances do drinking water regulations apply to geothermal wells?
- Licensing requirements for geothermal well and heat-exchange equipment installers

4:30 – 4:45 pm

Wrap-up and Adjourn

- Further Questions and CEU sign-out

CONTINUING EDUCATION

The American Ground Water Trust will provide a Certificate of Attendance to those attendees who sign-in and sign-out. Certificates will be mailed after the event.

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CALL FOR DETAILS FOR OTHER PROFESSIONS 603-228-5444

HOTEL INFORMATION

Holiday Inn Brownstone Hotel
1707 Hillsborough St
Raleigh, NC

Hotel Telephone: 919-828-0811

Directions included with registration
payment email confirmation.
\$89 room rate - free parking

AMERICAN GROUND WATER TRUST

The American Ground Water Trust (www.agwt.org) is a national, non-profit public education organization that has been providing ground water information, awareness and education since 1986. The Trust's mission:

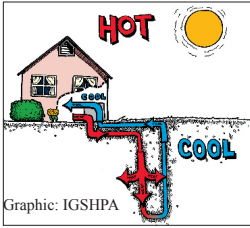
- ◆ Promoting efficient and effective ground water management
- ◆ Communicating the environmental and economic value of ground water
- ◆ Showcasing ground water science and technology solutions
- ◆ Increasing citizen, community and decision-maker awareness
- ◆ Facilitating stakeholder participation in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



ANOTHER GROUND WATER EDUCATION PROGRAM BROUGHT TO YOU BY:
 American Ground Water Trust
 50 Pleasant Street, Suite 2
 Concord, New Hampshire 03301-4073

GROUND SOURCE HEATING & COOLING FOR RESIDENTIAL AND COMMERCIAL PROPERTIES

Latest Technologies, Economic Advantages, Environmental Impacts and Regulations



Workshop Date and Location:
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8:00 am - 4:45 pm
Holiday Inn Brownstone Hotel
Raleigh, NC

- ◆ Does your Home, Business or School require heating and cooling?
- ◆ You need to KNOW MORE about Ground Source Heat Pumps!
- ◆ Do you build, buy or sell buildings with HVAC systems?
- ◆ Do you design or recommend HVAC systems?
- ◆ Do your clients demand value and efficiency?
- ◆ Do you inspect or regulate wells or borings?

REGISTRATION FORM or register online  at www.agwt.org

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| REGISTRATION (GENERAL) | <input type="checkbox"/> | \$185.00 |
| REGISTRATION (TRUST MEMBERS - \$250+ Level) | <input type="checkbox"/> | \$150.00 |
| EXHIBIT TABLE (Registration not included; You must also register.) | <input type="checkbox"/> | \$200.00 |
| CD of Presentations (Mailed Post-Event) | <input type="checkbox"/> Registrant Price \$ 15.00 or <input type="checkbox"/> Non-Registrant Price \$ 50.00 | |
| WALK-IN REGISTRATION (On day of event) | | \$225.00 |

(Registration includes workshop handouts, coffee breaks and on-site lunch.)

PAYMENT AMT \$ _____ CHECK (Payable to: American Ground Water Trust)
 VISA/MC AMEX DISCOVER PO # _____
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(Payment receipt will be sent via e-mail)
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(Registration confirmation will be sent via e-mail)
 Professional Training _____ Job Title _____
(Driller, Architect, Mech. Engineer, HVAC Tech, etc.)
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Sponsorship and Exhibits

There are opportunities to showcase work, projects, products and services as exhibitors or event sponsors. Sponsors will receive recognition for their financial assistance. Call 800-423-7748 for more information or visit www.agwt.org.

CANCELLATION POLICY

◆ Cancellations received in the AGWT office by 5 pm (EST) 5 days prior to the start of the event will receive a full registration refund less a \$25 processing fee.

◆ Cancellation 4-2 days prior to the start of the event will receive a 50% registration refund.

◆ Cancellations one day prior to the start of the event, or on the day of the event, are considered "No Shows." No refund will be made. (Substitutions gladly accepted).

◆ The AGWT will not cancel a conference program because of bad weather conditions. Except that, as the result of an event cancellation resulting from, (but not limited to) circumstances such as a state mandatory evacuation or a fire at the program facility, the AGWT will reschedule the event and honor registrations as payment for the new event.