

GEOHERMAL HEATING & COOLING WORKSHOP

Ground source heat pump solutions



“Geothermal heat pump systems are the most energy efficient, environmentally friendly, clean and cost-effective space conditioning systems”

US Environmental Protection Agency

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

Tuesday April 7th, 2015 - 8:00am to 4:30pm

NORRIS CENTER, Austin • Northcross, 2525 West Anderson Lane, Ste. 365, Austin, TX 78757

SPONSORS AND COOPERATORS



Preferred Pump



WHAT IT IS ALL ABOUT

Geothermal heating and cooling technology can be applied to virtually all types of space-conditioning, including, office buildings, schools, historic structures, low income housing, hospitals, and ice rinks to name a few examples. This workshop covers new innovations in system design, financing options and regulations that are lowering initial costs and increasing savings during operation.

The 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 geothermal systems for cooling and heating. This one-day program is an incredible opportunity to learn from experienced professionals who are on the forefront of geothermal innovation.

Continuing Education Credit

Architect Credits – 7.25 LUS (For HSW) Approved Through the American Inst. of Architects (Provider #G521)
TX Water Well Drillers & Pump Installers – 7.0 CEUs – Course #13445/Provider #1701
TX Air Conditioning and Refrigeration – CEU Approval – Course #13446/Provider #1701
IGSHPA Accredited Installers – 0.75 CEU's

7:15 – 8:00

REGISTRATION

8:00 – 8:20 RESOURCE SUSTAINABILITY AND GEOTHERMAL HEATING AND COOLING

Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH

- Water and Energy – The Sustainability Nexus
- Geothermal as a solution to energy generation impacts on the environment
- Design and installation of “outside” geothermal work to ensure groundwater protection

8:20 – 9:20 GROUND SOURCE HEAT PUMPS - THE FUNDAMENTALS

Chuck Hammock, PE, LEED AP, CGD, Principal, Andrews, Hammock & Powell, Inc, Macon, GA

- Understanding the basic physics of the heat transfer process
- Explanation of terminology (geoexchange, geothermal, ground source, BTUs, tons etc.)
- What happens to the heat transferred underground – where does it go?
- How to measure the efficiency of geothermal systems
- Computer models available for geothermal design

9:20 – 10:10 DRILLING AND COMPLETING GROUT AND LOOP INSTALLATION IN GEOTHERMAL BORES

Benito Gonzalez, Territory Representative, Baroid IDP, Fort Worth, TX

- 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

10:10 – 10:30

BREAK

10:30 – 11:15 ADVANTAGES OF VARIABLE FREQUENCY DRIVE COMPRESSOR GEOTHERMAL HEAT PUMPS

Mike Springer, Texas Territory Manager, WaterFurnance International, Southlake, TX

- How VFD compressor geothermal heat pumps work
- Turbulent flow in loop design: is it necessary to maximize efficiency?
- Reducing the size of a loop field by using VFD GHPs
- Duct Sizing and Layout Considerations- The old rules apply, but with new options
- How VFD GHPs help to balance air flow

11:15 – 12:00 GEOTHERMAL AT THE WHISPER VALLEY DEVELOPMENT, AUSTIN, TX

Dustin Gregoire, Bosch Thermotechnology Corp., Londonderry, NH

- Whisper Valley: A sustainable community with 7,500 Net-Zero ready homes
- Design of pre-installed geothermal infrastructure for homes
- Geothermal design for 2+ million square feet of retail and office space
- Phase 1: 240 homes connected to EcoSmart Solution program by mid 2015

12:00– 1:00

LUNCH

1:00 – 1:45 GEOTHERMAL SOURCED BUILDINGS, CITY BLOCKS, AND COMMUNITIES

Jay Egg, CMC, President, Egg Geothermal, Tampa, FL

- Geothermal: a solar charged “thermal battery”
- “Mini-grids” for geothermal energy transfer and load sharing
- Geo Benefits:
 - Elimination of combustion heating (no CO2)
 - No cooling tower water consumption
 - Storm resilience (no fuel storage or solar infrastructure)
- Case study of geothermal-sourced mini grid

1:45 – 2:45 AQUIFER THERMAL ENERGY STORAGE – OPEN LOOP DESIGN INNOVATION

Chuck Hammock, PE, LEED AP, CGD, Principal, Andrews, Hammock & Powell, Inc, Macon, GA

- How does Aquifer Thermal Energy Storage (ATES) work? - Fundamentals of design
- Borehole Thermal Energy Storage (BTES) – How does it compare to ATES?
- What are the advantages and disadvantages of ATES over a traditional open loop well design?
- Why are there so many ATES systems in operation in Europe, but uncommon in the United States?
- Case study from the Southeastern United States

2:45- 3:00

BREAK

3:00 – 3:45 COMMISSIONING GHP SYSTEMS – ACHIEVING ANTICIPATED PERFORMANCE

Don Penn, PE, CGD, Principal, Image Engineering Group, Grapevine, TX

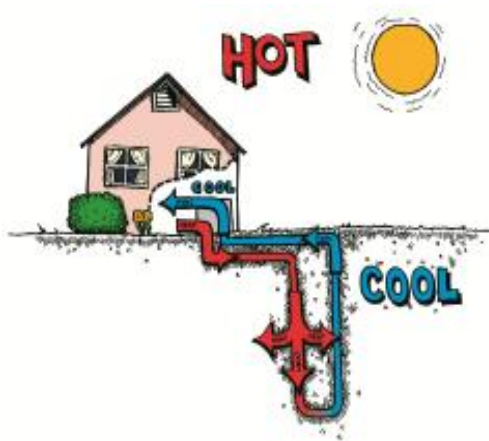
- How is a GHP HVAC system “Commissioned?”
- Design and Installation Mistakes – Where do they hide?
- What observations and measurements cannot be overlooked?
- Retro-commissioning of existing systems

3:45 – 4:30 STATUS OF THE GEOTHERMAL INDUSTRY

- **Jay Egg, CMC, President, Egg Geothermal, Tampa, FL**
- 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?

4:30

WRAP-UP AND ADJOURN



CARBON FOOTPRINT

Heating:
50 - 70% less than traditional systems

Cooling:
20 - 40% less than typical A/C units

