



U.S. DEPARTMENT OF  
**ENERGY**



The Ground Water Protection Council (GWPC) is a national non-profit organization, founded in 1983. The *GWPC Annual Forum* brings together state, federal, and local agency representatives with the responsibility for ground water/drinking water protection with industry, researchers, and environmental groups in a congenial venue on the latest technology and policy developments. For the last 27 years, the *Annual Forum* has been a major gathering, which brings these groups together to foster communication on safeguarding the nation's ground water supplies.

At the *Water/Energy Symposium* we will explore the complex relationships between water resources, quality, and sustainability, with energy development and generation in the midst of multiple components of change, with the goal of informing policy decisions at state, federal, and local levels and fostering interaction between those in the water and energy communities. The event will highlight various energy sectors and their impacts on water quality and quantity, as well as those water-use-intensive institutions that need and rely on energy, while also addressing emerging challenges associated with climate change adaptation. Partial event funding provided through cooperative agreements from each the USEPA Office of Ground Water & Drinking Water and the USDOE, National Energy Technology Laboratory.

### ***Conference Planning Committee & Contributors***

**Joe Lee**, GWPC President

Pennsylvania Dept of Environmental Protection

**Dave Terry**, GWPC Water/Energy Division

Massachusetts Dept of Environmental Protection

**Jamie Crawford**, GWPC Water Availability & Sustainability Div.

Mississippi Dept of Environmental Quality

**Stan Belieu**, Ground Water Research & Education Foundation

Nebraska Oil & Gas Conservation Commission

**Natenna Dobson**, Office of Oil and Natural Gas

US Department of Energy

**Allan Hoffman**, Office of Energy Efficiency & Renewable Energy

U.S. Department of Energy

**Robert Vagnetti**, Strategic Center for Natural Gas & Oil

National Energy Technology Laboratory, USDOE

**Albert Yost**, Strategic Center for Natural Gas and Oil Technology

National Energy Technology Laboratory, USDOE

**Sandra McSurdy**, Strategic Center for Natural Gas & Oil

National Energy Technology Laboratory, USDOE

**Kevin McCray**, Executive Director

National Groundwater Association

**Chris Rayburn**, Director, Research Management

Water Research Foundation

**Cat Shrier**, Watercat Consulting

**Art Hartstein**, IBM

### ***GWPC Staff***

**Mike Paque**, Executive Director

**Ben Grunewald**, Associate Director

**Paul Jehn**, Technical Director

**Mike Nickolaus**, Director Special Projects

**Dan Yates**, Director Organizational Development

**Len Erikson**, Director Public Support

**Brenda Short**, Event Coordinator

### ***Regulatory Consulting Staff***

**Steve & Mary Musick**, Musick Groundwater Consulting

**Bill Bryson**, Kansas Geological Survey

*The GWPC is a national association of state ground water and underground injection control agencies whose mission is to promote the protection and conservation of ground water resources for all beneficial uses, recognizing ground water as a critical component of the ecosystem.*

Acknowledgements: 2010 Water/Energy Sustainability Partners



[www.NGWA.org](http://www.NGWA.org)



[www.ASDWA.org](http://www.ASDWA.org)



[www.AllianceForWaterEfficiency.org](http://www.AllianceForWaterEfficiency.org)



[www.NEI.org](http://www.NEI.org)



[www.EDF.org](http://www.EDF.org)



[www.EnergyInDepth.org](http://www.EnergyInDepth.org)



[www.APPAnet.org](http://www.APPAnet.org)



[www.nacwa.org](http://www.nacwa.org)



[www.CleanWaterAmericaAlliance.org](http://www.CleanWaterAmericaAlliance.org)



[www.NRWA.org](http://www.NRWA.org)



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[www.nv-oc.org](http://www.nv-oc.org)



Citizens and Scientists for Environmental Solutions

[www.UCSUSA.org](http://www.UCSUSA.org)



[www.RiverNetwork.org](http://www.RiverNetwork.org)



American Water Works Association

[www.AWWA.org](http://www.AWWA.org)



UNDERGROUND INJECTION TECHNOLOGY COUNCIL

[www.UITCouncil.org](http://www.UITCouncil.org)



[www.NEIWPCC.org](http://www.NEIWPCC.org)



[www.STRONGERinc.org](http://www.STRONGERinc.org)



[www.glc.org](http://www.glc.org)



WATER RESEARCH FOUNDATION

[www.WaterResearchFoundation.org](http://www.WaterResearchFoundation.org)

~ On behalf of the Symposium Planning Committee... **THANK YOU!**

## Water/Energy Sustainability Symposium

@ the

2010 GWPC Annual Forum

Sunday, September 26

11:30 am - Registration open

12:00-5:00

GWPC Board of Directors Meeting

Room: Grand Station 3

Session Staff: Dan Yates

### GWPC Board of Directors Business Meeting *(open to everyone)*

- Board Discussion:
  - GWPC CO<sub>2</sub> Needs Assessment – Mike Nickolaus, GWPC **Abstract: 121**
  - Hydraulic Fracturing
  - Storm Water
  - Aquifer Storage & Recovery
- Board Briefings
  - Ground Water Research & Education Foundation
  - GWPC Divisions, Committees, & Workgroups
  - Other Organizations
- Board Resolutions for Consideration:
  - On Primacy for State Class VI UIC Programs
  - On Expanded Funding for Class VI UIC Programs
  - On Chemical Reporting and Disclosure
  - On Stormwater Rules

5:10-6:10

GWPC Water /Energy Division Meeting

Room: Grand Station 4

Session Staff: Mike Nickolaus

### GWPC Water /Energy Division Meeting *(open to everyone)*

**Division Chair-** Leslie Savage, Texas Railroad Commission

- State updates on hydraulic fracturing regulation
- Formation of a hydraulic fracturing workgroup
- CO<sub>2</sub> Needs Assessment Study
- Discussion of interstate commercial disposal of shale gas formation treatment wastes and injection of wastes near state boundaries (Texas/ Louisiana, Pennsylvania/ Ohio etc...)
- Acid gas disposal (Is it an issue and how big?)
- Open discussion of other issues

**POSTER PRESENTATIONS**

Room: Grand Station Ballroom Foyer

Session Staff: Ben Grunewald

All posters will be displayed Monday –Wednesday in Grand Station Ballroom Foyer  
(presenters will be available during breaks and lunches as noted)

Abstract #	Poster Title and Presenter	Presentation Time
Abstract: 1	Stimulating Gas Shale Without Hydraulic Fracturing - <b>Ernest E. Carter</b> , Carter Technologies Co.	Tuesday 1:00
Abstract: 25	Cyberinfrastructure for the Visualization and Simulation of Proposed Sustainable Practices in Dunkard Creek Watershed - <b>Amanda Hughes</b> , Carnegie Mellon U.	Tuesday 10:00
Abstract: 29	Hydrologic Cycle Energy Flux and the Water-Energy Nexus - <b>Michael Sevenser</b> , KCI Technologies, Inc	Tuesday 3:40
Abstract: 33	Water Requirements for Existing and Future Coal-Fueled Power Plants: Empirical and Modeled Data - <b>Erik Shuster</b> , USDOE– NETL	Tuesday 6:20
Abstract: 35	The Embedded Electricity in Water: Single-family Home, Phoenix, Arizona - <b>Karen Collins</b> , Salt River Project	Tuesday 6:20
Abstract: 38	Evaluating Water Quality & Energy Efficiency of Standard and Marketed "Green" Home Water Heating Systems - <b>Randi Lieberman</b> , Virginia Tech	Tuesday 6:40
Abstract: 46	The Energy-Water Collision: 10 Things You Should Know, <b>Nadia Madden</b> , Union of Concerned Scientists	Tuesday 6:40
Abstract: 53	Sustainable Cooling Water Treatment Using Controlled Hydrodynamic Cavitation - <b>Philip Vella</b> , VRTX Technologies	Wednesday 10:00
Abstract: 55	Use of Nanofiltration to Reduce Cooling Tower Water Usage - <b>Susan J. Altman</b> , Sandia National Laboratories	Tuesday 3:40
Abstract: 56	Potable Reuse Aquifer Storage Recovery Projects and Regulations - <b>Cat Shrier</b> , Watercat Consulting	Tuesday 3:40
Abstract: 69	Pilot Projects on Sustainable Water Management and Green Building Approaches - <b>Laura Dufresne</b> , The Cadmus Group, Inc	Wednesday 10:00
Abstract: 75	Evaluating Sustainable Non Chemical Water Treatment Technologies for Commercial/Industrial Cooling Tower Applications - <b>Peter F. Johnson</b> , AECOM	Wednesday 12:20
Abstract: 76	Source Water Quality and Drinking Water Disinfection By-Product Specifications in the Monongahela River Basin - <b>Jessica Wilson</b> , Carnegie Mellon University	Tuesday 6:20
Abstract: 87	Approaches for Assessing Groundwater Availability Under Competing Demands and Climate Change – <b>John Vaccaro</b> , USGS, Washington Water Center	not attending
Abstract: 93	Zeolite Sorbents for Treatment of Water for Reuse – <b>William Collentro</b> , Worcester Polytechnic Institute	Tuesday 1:20
Abstract: 102	Understanding Water Sector Interdependencies – A Critical Step to Enhancing Resiliency - <b>Laura Flynn</b> , Water Security Division U.S. EPA	Tuesday 1:00
Abstract: 107	Risk and Insurance Issues -- Green Infrastructure Design - <b>Robert Hughes</b> , Insurance and risk advisor to design firms	Wednesday 12:20
Abstract: 115	Rainfall = CO2: Green Infrastructure as Solution - <b>Valerie Strassberg</b> , Nature's Voice Our Choice	Wednesday 10:00
Abstract: 123	Going Green In Your Power and Automation Design is Like a River - <b>Grant Van Hemert</b> , Water Wastewater Competency	Monday 11:30
Abstract: 128	Produced Water Treatment and Use as a Water Resource, <b>Forbes Guthrie</b> , Produced Water Development, LLC	Wednesday 12:20
Abstract: 142	North American Unconventional Fuel Resources Interactive Map & Digital Repository Project - <b>Michelle M. Kline</b> , University of Utah	Tuesday 1:20
Abstract: 154	Design and Development of the Alternative Water Source Information System (AWSIS) - <b>Roy Arthur</b> , ALL Consulting; and <b>Nathan Alleman</b> , ALL Consulting	Tuesday 10:00
Abstract: 159	NF-co-doped TiO <sub>2</sub> for Visible/Solar Treatment and Disinfection of Water Including Applications in Developing Countries - <b>Miguel Pelaez</b> , U. of Cincinnati	Tuesday 1:20
Abstract: 160	UV/H <sub>2</sub> O <sub>2</sub> Process for Treatment of β-lactam Antibiotics in Water - <b>Xuexiang He</b> , University of Cincinnati	Tuesday 10:00
Abstract: 161	Development of CNT-based sensors for detecting cyanotoxins in water - <b>Changseok Han</b> , University of Cincinnati	Tuesday 3:40
Abstract: 184	Interdependent Water, Energy and Carbon Management Issues and Assessment Models for Basin-Scale Energy Development - <b>Andrew Wolfsberg</b> , Los Alamos National Laboratory	Tuesday 1:00

*The GWPC provides a forum for stakeholder communication and research in order to improve governments' role in the protection and conservation of ground water.*

Monday, September 27

7:00- Registration-Morning Reception in Exhibit Hall - Room: Reflections & Waterfront

8:00-11:30 SHORT COURSE / WORKSHOP / ROUNDTABLE

Room: Grand Station 1&2 Session Staff: Mike Nickolaus  
**Workshop: Water Issues (And Solutions) Associated with Hydraulic Fracturing**

**This Special Workshop is FREE to the Public**  
**-Pre-registration required-**

Welcome: **Mike Nickolaus** (GWPC Special Projects Director)

**Part 1:** Technical Aspects of Hydraulic Fracturing Water Management

**Moderator -Viola Schatzinger** (PTTC's lead for Environmental/Water Issues Tech Center)

- GTI Water Management Consortiums, Marcellus & Barnett Shale – **Tom Hayes**, GTI
- **Abstract: 183** Well Stimulation 101 (the process, water requirements, and the chemicals used) – **Robert Garland**, Universal Well Services
- Short video - Basics of Hydraulic Fracturing by Chesapeake Energy
- **Abstract: 168** Marcellus Shale Water Management – **Tony Gaudlip**, Range Resources
- **Abstract: 52** WVU's (DOE) - Zero Discharge Management of Marcellus Frac Water Returns - **Paul Ziemkiewicz**, WV Water Research Inst
- **Abstract: 100** GE Global Research (DOE) Cost Effective Recovery of Low-TDS Frac Flowback Water for Re-Use – **Harish Acharya**, GE Global Research Center
- **Abstract: 40** ALL, Inc. (DOE) Considerations for Water Treatment and Re-Use in Shale Gas Development– **David Alleman**, ALL Consulting

**Part 2:** Regulatory Aspects of Hydraulic Fracturing Water Management

Moderator: **Lori Wrotenbery**, Director of Oil and Gas, OCC

**Abstract: 31** STRONGER Guidelines on Hydraulic Fracturing – **Lori Wrotenbery**, Oklahoma Corporation Commission

- State Regulator Panel - **Joe Lee/Scott Perry** Pennsylvania Depart. Environmental Protection; **Brad Field**, New York Dept. Environmental Conservation; **James Martin**, West Virginia Department of Environmental Protection; and **Stan Belieu**, Nebraska Oil & Gas

**Workshop participants are invited to attend the Dr. Engelder Luncheon for a cost of \$20. For those registered for the entire symposium, there is no additional charge.**

**Session Sponsored by: Schlumberger**

Room: Room: Grand Station 4&5 Session Staff: Steve Musick  
**Short Course: The Legal Framework: Water Allocation, Quality, and Energy**  
**Abstract: 39**

**Moderator - Seth Mendelsohn**, Corporate Counsel, Pennsylvania-American Water Company

The treatment and distribution of water to customers requires energy. Low-cost energy availability is essential to keeping water production costs and rates low for customers. At the same time, demand-side management approaches need to be considered for conservation reasons. This seminar will discuss the legal issues involved in the nexus between water and energy. It will also examine various legislative approaches to deal with the issue. Finally, it will present the latest case law addressing the water industry.

**Kathy L. Pape**, President, Pennsylvania-American Water Company

**Brandon Kernen**, New Hampshire Department of Environmental Services

**David M. Flannery**, Jackson Kelly

**Abstract: 164 Jacqueline Daoust**, Daoust Consulting

**Mary Martha Truschel**, Assistant Counsel Department of Environmental Protection

**Joshua Becker**, Dewey & LeBoeuf LLP.

Room: Room: Grand Station 3 Session Staff: Dan Yates  
**Source Water Roundtable - Communicating National, State, and Local Source Water Protection Strategies**

**Moderator - Mike Eggert**, OH EPA  
**Updates from GWPC and State Programs**

**Federal Source Water Efforts**

- EPA Office of Ground Water & Drinking Water – **Roy Simon**, USEPA
- EPA Office of Wastewater Management- **Maureen Tooke**, USEPA

**Source Water Protection Technical Presentations 10:20-11:20**

- **Abstract: 42** Protecting Groundwater Quality: The Spring Creek Watershed Drilling Ordinance Success Story - **Todd Giddings**, Todd Giddings and Associates, Inc
- **Abstract: 135** American Water Works Association G-300 Standard (Source Water Protection): Steps to Protect Source Water Quality - **Chi Ho Sham**, The Cadmus Group
- **Abstract: 188** Watershed-Based Source Water Protection Programs in Pennsylvania - **G Patrick Bowling**, PA DEP



Lunch Presentation by: **Dr. Terry Engelder Bio 47**  
Professor of Geosciences, Pennsylvania State University

*Over 1,000,000 hydraulic fracturing stimulations within the USA without compromising fresh groundwater: True or False?*

Room: Admiral (buffet lunch begins at 11:00 am in the Reflections & Waterfront. Presentation will begin at 12:00)

11:30-12:45 Luncheon with the Professor

Monday, September 27

12:50-6:00 Opening General Session

# WATER ENERGY™

IN CHANGING CLIMATES

Room: Admiral

Session Staff: Mike Paque

12:50-2:50

## Water & Energy in Changing Climates: State, Federal, and Local Views

Welcome - **Mike Paque**, GWPC Executive Director

Moderator- **Joe Lee**, Pennsylvania Department of Environmental Protection & GWPC President



1:00 Keynote : **Robert F. Kennedy Jr.**,  
President Waterkeeper Alliance **Bio 155**



1:35 **Glenn H. Rider II**, Director, Bureau of  
Watershed Management, PA DEP **Bio 137**



2:00 **Chris Smith**, Deputy Assistant Sec.  
Oil & Natural Gas, DOE **Bio 134**



2:25 **Cynthia Dougherty**, Director, Office of  
Ground Water & Drinking Water, EPA **Bio 131**

Room: Reflections & Waterfront

2:50-3:20 BREAK - in Exhibit Hall

Room: Admiral

Session Staff: Mike Paque

3:20-6:00

## Water & Energy in Changing Climates: Research, Applied Science, & Other Initiatives

Moderator- **Stan Belieu**, Nebraska Oil & Gas & GWPC Vice-President

3:20-3:40 Water-Energy Research at the U.S. Department of Energy – **Allan Hoffman**, Office of Energy Efficiency and Renewable Energy, US Department of Energy **Abstract 44**

3:40-4:00 Groundwater Banking: One Management Option to Meet Marcellus Water Needs - **Richard R. Parizek**, Professor of Geology and Geo-Environmental Engineering, Department of Geosciences, The Pennsylvania State University **Abstract 82**

4:00-4:20 Energy & Water: Potential Futures - **C. Andrew Miller**, Chief, Atmospheric Protection Branch, US EPA – National Risk Management Research Laboratory **Abstract 166**

4:20-4:40 Natural Gas and Water in the New Energy Economy – **Richard Ward**, Energy Future Coalition **Abstract 14**

4:40-5:00 BREAK - in Exhibit Hall

5:00-5:20 Water Impacts of a Changing Energy Policy - **Michael E. Webber**, University of Texas - The Future of the Water-Energy Nexus **Abstract 190**

5:20-5:40 Global Drivers and Mechanisms to Balance the Energy-Water Nexus - **Jan Dell**, CH2MHill and World Business Council for Sustainable Development **Abstract 17**

5:40-6:00 The Water Energy-Nexus: The Role of Global Change Science – **Charles Vorosmarty**, The City University of New York **Abstract 163**

Room: Reflections & Waterfront

6:00-8:00

**Water/Energy Sustainability Symposium GWPC Annual Forum**  
**Welcome/Networking Reception**

*Sponsored by: Dow Microbial Control*

**Tuesday, September 28**

**Room: Reflections & Waterfront**

**7:00– Registration & Morning Reception in Exhibit Hall *Sponsored by: ExxonMobil***

**8:00-10:00 Morning Sessions**

***Water/Energy Sustainability Symposium Tracks***

***GWPC Annual Forum Tracks***

**Room: Grand Station 1&2**      **Session Staff: Mike Nickolaus**  
**Water for Energy**  
Related Posters: 29, 154, 184  
**Moderator- John Rogers**, Union of Concerned Scientists

**Room: Grand Station 3&4**      **Session Staff: Steve Musick**  
**Water Availability & Sustainability**  
*Planning for Future Demands*  
Related Posters: 102  
**Moderator- Jamie Crawford**, Mississippi DEQ

**Room: Grand Station 5**      **Session Staff: Mary Musick**  
**Water Quality**  
*Nutrient and other Nonpoint Source Impacts to Ground Water*  
Related Posters: 25  
**Moderator- Glenn Rider**, Pennsylvania DEP

**8:00-8:20**      **Abstract 8**  
Incorporating Water Constraints into Electric Transmission Planning – **Alex Schroeder**, Western Governors' Association

**8:00-8:20**      **(full paper available)**      **Abstract 10**  
How Water Treatment Drives Regional Power Demands And What Can Be Done About It - **Frederick Bloetscher**, Florida Atlantic University

**8:00-8:20**      **Abstract 57**  
Protecting Pennsylvania's Drinking Water through Computer Modeling and Geospatial Analysis - **Alfred Guisepppe**, SSM Group, Inc

**8:20-8:40**      **Abstract 68**  
Great Lakes Energy Water Nexus Initiative - **Victoria Pebbles**, Great Lakes Commission

**8:20-8:40**      **Abstract 27**  
Assessing Water Use and Availability Trends in New Hampshire - **Brandon Kernen**, New Hampshire Department of Environmental Services

**8:20-8:40**      **Abstract 81**  
The Unintended Energy Impacts of Increased Nitrate Contamination from Biofuels Production - **Kelly Twomey**, NSF Graduate Research Fellow

**8:40-9:00**      **Abstract 24**  
Water Use, Electric Power, and Nuclear Energy: A Holistic Approach to Environmental Stewardship - **William Skaff**, Nuclear Energy Institute

**8:40-9:00**      **Abstract 72**  
Water Supply Reservoir Viability and Water Conservation Study in Oklahoma – **Karl Stickle**, C.H Guernsey & Company

**8:40-9:00**      **Abstract 83**  
Best Agricultural Management Practices (BMPs) for Biofuels Feedstock Production - **Xiaobo Xue**, University of Pittsburgh

**9:00-9:20**      **Abstract 122**  
Future Projections of Water Demands for Energy – **Robin Newmark**, National Renewable Energy Laboratory

**9:00-9:20**      **Abstract 109**  
Integrated Water and Energy Planning for Sustainable Rural Economies - **Brian Starkebaum**, Yuma Conservation District

**9:00-9:20**      **Abstract 45**  
The Impact of Non-Point Source Contamination on the Surficial Aquifer of the Delmarva Peninsula - **Judith M. Denver**, Hydrologist, U.S. Geological Survey

**9:20-9:40**      **Abstract 124**  
Quantifying Indirect Water Impacts of Buildings' Energy Efficiency – **Doug Elliott**, Pacific Northwest National Laboratory

**9:20-9:40**      **Abstract 102**  
Understanding Water Sector Interdependencies – A Critical Step to Enhancing Resiliency - **John Whittler**, US EPA Office of Water

**9:20-9:40**      **Abstract 173**  
Nutrient Problems in the U.S. Call for Urgent Action - **Jim Taft**, Association of State Drinking Water Administrators

**9:40-10:00**      **Abstract 116**  
A Carbon Footprint is not Enough - **Brandy Lellou**, Executive Director, Nature's Voice Our Choice

**9:40-10:00**      **Abstract 132**  
GIS and Water Sustainability: A Taunton River Basin Case Study - **Mark E. Nelson**, Horsley Witten Group

**9:40-10:00**      **Abstract 59**  
Applications in the Use of Isotope Geochemistry to Identify the Origin of Methane in the Environment - **Fred Baldassare**, Pennsylvania Department of Environmental Protection

**Room: Reflections & Waterfront**  
**10:00-10:20 BREAK - in Exhibit Hall**

**Grand Station Ballroom Foyer**      **Session Staff: Ben Grunewald**  
**Poster Session: Abstracts: 25, 160, 154**

**Event Exhibitors:**

National Ground Water Association  
Wendel  
Alfred Benesch & Company  
Idaho National Laboratory

National Farmers Union  
212 Resources  
Dow Microbial Control  
EPA Decentralized MOU Group

Pennsylvania Department of Environmental Protection  
National Energy Technology Laboratory  
Pennsylvania Ground Water Association

Watercat Consulting  
Environmental Service Laboratories, Inc.  
Underground Injection Technology Council

Tuesday, September 28

10:20-12:10 Mid-Morning Sessions

Water/Energy Sustainability Symposium Tracks

GWPC Annual Forum Tracks

Room: Grand Station 1&2  
 Session Staff: Mike Nickolaus  
**Water and Unconventional Natural Gas Production**  
*Supplying Water for Well Stimulation*  
 Related Posters: 1  
**Moderator- Natenna Dobson, USDOE**

Room: Admiral  
 Session Staff: Jacqueline Daoust  
**Water and Geothermal Energy**  
*Ground Source Heat Pumps*  
**Moderator- Kevin McCray, NGWA**

Room: Grand Station 3&4  
 Session Staff: Mary Musick  
**Joint Water Availability & Sustainability/Water Quality Session**  
*Managed Aquifer Recharge*  
**Moderator- Derek Smithee, Oklahoma Water Resources Board**

Room: Grand Station 5  
 Session Staff: Paul Jehn  
**Data Needs for Resource Management:**  
*Current Application & Future Development*  
**Moderator- Stan Belieu, Nebraska Oil & Gas**

10:20-10:40 **Abstract 4**  
 Water Availability and Management in Shale Gas Operations – **John Veil**, Argonne National Laboratory

10:20-10:40 **Abstract 156**  
 State Regulatory Oversight of Geothermal Heat Pump Installations: A National Survey - **Kevin McCray, NGWA**

10:20-10:40 **Abstract 85**  
 A Collaborative Process to Identify the Most Feasible Aquifer Recharge Sites in Oklahoma - **Nathan Smith, CDM**

The RBDMS Oil and Gas National Data Portal - **Stan Belieu, NOGCC**

10:40-11:40 **Abstract 89**  
 Mitigating for Energy-related Consumptive Water Use in the Susquehanna River Basin - **Andrew Dehoff**, Susquehanna River Basin Commission

10:40-11:00 **Abstract 139**  
 Preventing Source Water Zone II Impacts on High-Capacity Well Fields from Geothermal Heat Pump Systems **Todd Giddings**, Todd Giddings & Assoc.

10:40-11:00 **Abstract 125**  
 Stormwater: Benefit or Detriment to Groundwater? - **Barb Adkins**, City of Portland, Oregon, Bureau of Environmental Services

**Abstract 58** GWPC's Risk Based Data Management System (RBDMS) Overview - **Paul Jehn, GWPC**

11:00-11:20 **Abstract 105**  
 Hydrogeologic and Water Resource Considerations Related to Natural Gas Production in the NYC Water Supply Watershed - **Frank Getchell**, Leggette, Brashears & Graham, Inc.

11:00-11:20 **Abstract 32**  
 Diversion of Existing Groundwater Infrastructure for Geothermal Heat Exchange - **Matthew J. Hammer**, Sanborn, Head & Associates

11:00- 11:20 **Abstract 186**  
 EPA Office of Wetlands, Oceans and Watersheds: Stormwater Update – **Edward W. Lavery**, USEPA Region1

**Abstract 191** Using RBDMS to Manage Oil and Gas Activities in New York and Display Data Using the RBDMS Wellbore Schematic Utility - **Amanda Trotter**, New York DEP

11:20-11:40 **Abstract 136**  
 Significance of Uncertainty in Water Resources Decisions for Western Pennsylvania's Marcellus Shale - **Austin Mitchell**, Carnegie Mellon U.

11:20-11:40 **Abstract 54**  
 Assessing Thermal Impacts of an Open-Loop Ground Source Heat Pump **Vicky L. Freedman**, Pacific Northwest National Laboratory

11:20-11:40 **Abstract 187**  
 EPA Office of Ground Water and Drinking Water: Stormwater Update – **Roy Simon**, USEPA HQ

**Abstract 167** RBDMS Water a New Regulatory Tool Water Data Management - **Gregg Miller**, Ohio DNR

11:40-12:00 **Abstract 172**  
 Evaluation of Abandoned Mine Drainage as a Water Supply for Hydraulic Fracturing in the Marcellus Shale - **Elise Barbot**, U. of Pittsburgh

11:40-12:00 **Abstract 147**  
 Standing Column Wells at Villanova University - **Albert A. Koenig**, ARB / Geowell

11:40-12:00 **Abstract 43**  
 Low Impact Development Stormwater Controls and Changing State and Federal Regulations – **Steven P. Roy**, Geosyntec

**Abstract 71** Use of Existing Public Databases to Improve Groundwater Monitoring - **Evan Kane**, Groundwater Planning Supervisor, NC Department of Environment and Natural Resources

12:00-12:20 **Abstract 127**  
 Developing Sustainable New Water Supplies for Natural Gas Development - **Kenneth Nichols**, CH2M HILL

12:00-12:20 **Abstract 80**  
 Ground Source Heat Pump Monitoring to Ensure Source Water Protection, **Jacqueline Daoust**, Daoust Consulting

12:00-12:20 **Abstract 140**  
 Incidental Recharge in Montana, **John LaFave**, Montana Bureau of Mines and Geology

**Abstract 144 Panel** - UIC National Database: Building Data Quality for More Effective Use: **Beth Hall**, USEPA -- Lead/Moderator

**Trang Le**, USEPA -- QA/QC Tools and Reports to Validate Data

**Beth Hall**, USEPA -- Use of Data to Identify Issues and target resolution.

**Kurt Hildebrandt**, USEPA, R7 -- Experiences in Addressing program inconsistencies in QA/QC Sessions

12:20-1:40 Lunch on your own

Grand Station Ballroom Foyer

Session Staff: Ben Grunewald

Poster Session: Abstracts: 184, 102, 1, 142, 159, 93



Tuesday, September 28

1:40-3:40 **Afternoon Sessions**

**Water/Energy Sustainability Symposium Tracks**

**GWPC Annual Forum Tracks**

<p>Room: Grand Station 1&amp;2 Session Staff: Paul Jehn <b>Water and Unconventional Natural Gas Production</b> <i>Protecting Ground Water During Well Stimulation</i> Related Posters: 55, 142 <b>Moderator- Leslie Savage</b>, Texas Railroad Commission</p>	<p>Room: Admiral Session Staff: Laura Dufresne <b>Water Utilities</b> <i>Improved Technology for Water/Energy Savings and Sustainability</i> Related Posters:159, 160, 161 <b>Moderator- Vanessa M. Leiby</b>, The Cadmus Group, Inc</p>	<p>Room: Grand Station 3&amp;4 Session Staff: Mike Nickolaus <b>CO<sub>2</sub> Geosequestration</b> <i>Technical and Policy Considerations</i> <b>Moderator- Ben Knape</b>, Texas Commission of Environmental Quality</p>	<p>Room: Grand Station 5 Session Staff: Mary Musick <b>Water Quality</b> <i>Underground Injection Practices And Ground Water Protection</i> Related Posters: 56, 93 <b>Moderator- John Taylor</b>, EPA Region 5</p>
<p>1:40-2:00 <b>Abstract 15</b> Zero Discharge Recycling Process for Marcellus Shale Frac Water - <b>Tom Lewis III</b>, Lewis Environmental Services, Inc.</p>	<p>1:40-2:00 <b>Abstract 141</b> Micro-Hydro Energy Recovery Opportunities in Water Distribution Systems: Impacts of Seasonal and Diurnal Demand Variabilities on Estimating Payback - <b>Anna Zaklikowski</b>, HDR Engineering</p>	<p>1:40-2:00 <b>Abstract 74</b> The Energy-Water Nexus and the Role of Carbon Capture and Sequestration - <b>Vincent Tidwell</b>, Sandia National Laboratories</p>	<p>1:40-2:00 <b>Abstract 23</b> Underground Injection and Sequestration and Underground Sources of Drinking Water - <b>Richard Brown</b>, Subsurface Technology, Inc.</p>
<p>2:00-2:20 <b>Abstract 26</b> Biocides 101: The Chemistry, Use, and Regulation of Biocides Used for Hydrocarbon Production - <b>Donald J. Love</b>, The Dow Chemical Company</p>	<p>2:00-2:20 <b>Abstract 90</b> Sustainable Solutions and Cost-Saving Applications for Small Water Systems: Case Studies - <b>James J. Rhoades, Jr.</b>, Alfred Benesch &amp; Company</p>	<p>2:00-2:20 <b>Abstract 150</b> Physico-Chemical Treatments for Flue-Gas Derived Water from Oxy-Fuel Power-Production with CO<sub>2</sub>-Capture - <b>Danylo Oryshchyn</b>, DOE / NETL</p>	<p>2:00-2:20 <b>Abstract 176</b> ASR Application in Climate Change Adaptation: The Need, Issues and Research Focus - <b>Y. Jeffrey Yang</b>, USEPA ORD</p>
<p>2:20-2:40 <b>Abstract 41</b> Water Issues Related to Unconventional Oil and Gas Production - <b>John Lucey</b>, HDR Engineering</p>	<p>2:20-2:40 <b>Abstract 101</b> Scheduling Pump Operation to Save Energy Cost - <b>Christine Dejan</b>, The Regional Municipality of Durham</p>	<p>2:20-2:40 <b>Abstract 60</b> U.S. Geological Survey National Geologic Carbon Dioxide Sequestration Assessment Project - <b>Peter D. Warwick</b>, USGS</p>	<p>2:20-2:40 <b>Abstract 126</b> Demonstrating Stormwater Infiltration is Protective of Groundwater Quality - <b>Heidi Blischke</b>, GSI Water Solutions Inc</p>
<p>2:40-3:00 <b>Abstract 162</b> State Investigations of Oilfield Ground Water Contamination Incidents and Their Role in Advancing Regulatory Reforms - <b>Scott Kell</b>, Consulting Geologist</p>	<p>2:40-3:00 (full paper avail.) <b>Abstract 120</b> Applying a Sustainability Metric to Today's Standard Economic Analyses - <b>Holly Johnson</b>, N.A. Water Systems, a Veolia Water Solutions &amp; Technologies Company</p>	<p>2:40-3:00 <b>Abstract 177</b> Proposed CO<sub>2</sub> Rules and the National UIC Program: A Multi-Stakeholder Perspective – <b>Bob Van Voorhees</b>, The Carbon Sequestration Council, and <b>Scott Anderson</b>, Environmental Defense Fund</p>	<p>2:40-3:00 <b>Abstract 157</b> Water Quality Considerations in Aquifer Storage &amp; Recovery Systems: A Safe Drinking Water Act Perspective - <b>Anna Zaklikowski</b>, HDR Engineering</p>
<p>3:00-3:20 <b>Abstract 16</b> The "Bainbridge Natural Gas Incident" in Geauga County, Ohio: What Really Happened! - <b>Tom Tomastik</b>, Ohio DNR, Division of Mineral Resources Management</p>	<p>3:00-3:20 <b>Abstract 88</b> Feed Water Reduction in Industrial Water Purification Systems, <b>William V. Collentro</b>, Worcester Polytechnic Institute</p>	<p>3:00-3:40 <b>DOE/NETL Initiatives Abstract 91</b> Water and Carbon Storage Related Research at DOE/NETL - <b>Andrea McNemar</b>, Department of Energy / National Energy Technology Laboratory</p>	<p>3:00-3:20 <b>Abstract 21</b> Sustainable UV Disinfection Solutions for Large-Scale Municipal Applications – <b>Katrina Williams</b>, Trojan Technologies</p>



Annual Forum Participants will receive the *Ground Water Communique*

Look for the NEW *gwpc.org* - COMING 2011 ~

Tuesday, September 28			
Afternoon Sessions Continued			
<b>3:20-3:40</b> <b>Abstract 51</b> The Comparative Analysis of Hydraulic Fracturing and Underground Injection – <b>Dan Arthur</b> , All Consulting	<b>3:20-3:40</b> <b>Abstract 145</b> The Energy and Water Efficiency Benefits of Distributed Recycled Water Production Delivery – <b>Graham Symmonds</b> , Global Water Resources	<b>Abstract 2</b> Regional Carbon Sequestration Partnership Water Working Group - <b>Ryan J. Klapperich</b> , Energy and Environmental Research Center, University of North Dakota <b>Abstract 3</b> Managing Water from CCS Programs - <b>Christopher Harto</b> , Argonne National Laboratory	<b>3:20-3:40 (full paper avail.)</b> <b>Abstract 174</b> Need for Improvement in Methodology for Assessing Induced Seismicity Potential at an Injection Site - <b>Chester Miller</b> , Retired DuPont
<b>Room: Reflections &amp; Waterfront</b> <b>3:40-4:00 BREAK - in Exhibit Hall</b>		<b>Grand Station Ballroom Foyer</b> Session Staff: Ben Grunewald <b>Poster Session: Abstracts: 29, 55, 56, 161</b>	
4:00-6:00      Late Afternoon Sessions			
Water/Energy Sustainability Symposium Tracks			GWPC Annual Forum Tracks
<b>Room: Grand Station 1&amp;2</b> Session Staff: Mike Nickolaus <b>Water and Unconventional Natural Gas Production</b> <i>Managing Water After Well Stimulation</i> Related Posters: 76 <b>Moderator- Robert Vagnetti</b> , NETL	<b>Room: Admiral</b> Session Staff: Dan Yates <b>Water &amp; Electric Power Generation</b> Related Posters: 33 <b>Moderator- Kurt Hildebrandt</b> , USEPA R7	<b>Room: Grand Station 5</b> Session Staff: Paul Jehn <b>Water &amp; Power Utilities</b> <i>Saving Water/Energy Resources</i> Related Posters: 35, 53, 75, 115 <b>Moderator- Kathleen O'Connor</b> , NY State Energy Research & Development Authority	<b>Room: Grand Station 3&amp;4</b> Session Staff: Steve Musick <b>Joint Water Availability &amp; Sustainability/Water Quality Session:</b> <i>Water Resource Characterization and Assessment – Quality and Quantity</i> <b>Moderator- Marty Link</b> , Nebraska DEQ
<b>4:00-4:20</b> <b>Abstract 73</b> Economic Treatment of Frac Flow-Back Water to Recyclable Condition Using Physical Chemical Processes - <b>David H. Manz</b> , Pure Filtered Water International Ltd.	<b>4:00-4:20</b> <b>Abstract 19</b> Water and Coal: A Case Study of Carbon Capture's Influence on Water in Colorado River Basin - <b>Anna Sommer</b> , Sommer Energy	<b>4:00-4:20</b> <b>Abstract 96</b> Listening to Your System – <b>Thomas Watts</b> , Badger Meter, Inc.	<b>4:00-4:20</b> <b>Abstract 30</b> Approach to Delineating and Assessing Saline Groundwater Resources in the Southern Mid-Continent and Adjacent Areas - <b>Stanley T. Paxton</b> , USGS OK Water Science Center
<b>4:20-4:40</b> <b>Abstract 165</b> An Integrated Water Treatment Solution for Sustainable Water Resource Management in the Marcellus Shale - <b>Matthew Bruff</b> , Altela, Inc. Denver Technology Center	<b>4:20-4:40</b> <b>Abstract 133</b> Beyond the Energy-Water Nexus – Developing Sustainable Water Supply Solutions for the Electric Power Industry - <b>James M. Oliver</b> , Schlumberger	<b>4:20-4:40</b> <b>Abstract 66</b> The Link Between Water Loss & Energy Consumption: Southern California Edison's Embedded Energy in Water Pilot Program - <b>Reinhard Sturm</b> , Water Systems Optimization, Inc.	<b>4:20-4:40</b> <b>Abstract 175</b> The North Carolina Groundwater Resource Evaluation Program - A Decade of Characterization of Fractured Bedrock Aquifers of the Piedmont and Mountains – <b>Evan Kane</b> , NC Dept. of Environment & Natural Resources
<b>4:40-5:00</b> <b>Abstract 169</b> The Integrity of Ground Water Supplies in Areas of Oil and Gas Development- <b>Andrew Stone</b> , American Ground Water Trust	<b>4:40-5:00</b> <b>Abstract 97</b> Measuring the Sustainability of Wastewater Reuse in Power Plant Cooling Systems - <b>Briana Niblick</b> , University of Pittsburgh	<b>4:40-5:00</b> <b>Abstract 153</b> Recycling Conserves Water AND Energy - <b>David J. Reardon</b> , HDR, Inc.	<b>4:40-5:00</b> <b>Abstract 185</b> Groundwater Classification Approaches: Importance and Applications – <b>Kevin Frederick</b> , WY DEQ
<b>5:00-5:20</b> <b>Abstract 119</b> Sustainable Natural Gas Development through Superior Water Management - <b>Robert Waits</b> , 212 Resources	<b>5:00-5:20</b> <b>**Cancellation**</b> <b>Abstract 99</b> Electric Utility Investment in Alternative Condenser Technologies: A Real Options Approach - <b>Christian Lastoskie</b> , University of Michigan	<b>5:00-5:20</b> <b>Abstract 171</b> Easing the Water Constraints on Power Plant Cooling with Treated Municipal Wastewater: Insights from Pilot-scale Cooling Tower Tests- <b>Radisav D. Vidic</b> , University of Pittsburgh	<b>Room: Grand Station 3&amp;4</b> <b>5:00-6:10</b> Session Staff: Mary Musick <b>GWPC Water Quality Division Meeting</b> <i>(open to everyone)</i>

Tuesday, September 28

Late Afternoon Sessions - continued

<p><b>Wrap up: Unconventional NG Production</b> 5:20-5:50 Abstract 22 Deep Shale Natural Gas and Water Use, Part Two: Abundant, Affordable, and Still Water Efficient - <b>Matthew E. Mantell</b>, Chesapeake Energy Corporation 5:50-6:00 Discussion Session</p>	<p>5:20-5:40 Abstract 146 Water Vulnerabilities for Existing Coal-fired Power Plants - <b>Deborah Elcock</b>, Argonne National Laboratory</p>	<p>5:20-5:40 Abstract 182 The Carbon Footprint of Water - <b>Wendy Wilson</b>, National Program Director, River Network</p>	<p>GWPC Water Quality Division Continued Division Chair- <b>Audrey Eldridge, OR DEQ</b> -Ground source heat pump ground water protection regulation -Stormwater (Federal Regulatory Coordination) -open discussion</p>
<p>Room: Reflections &amp; Waterfront 6:00-7:00 Networking Hour in Exhibit Hall Sponsored by: <b>EnCana Oil &amp; Gas (USA)</b></p>	<p>Grand Station Ballroom Foyer Poster Session: Abstracts: 76, 33, 35, 38, 123, 46</p>		<p>Session Staff: <b>Ben Grunewald</b></p>

<p>Room: Fountain View 6:20-7:30</p> <p>Review Activities for 2011 Discuss &amp; Prioritize for Committee Action:</p> <ul style="list-style-type: none"><li>- Report -- <i>Summary of Common Groundwater Issues Identified by the NGWSAC</i></li><li>- Nutrient Impacts on Groundwater</li><li>- Underserved Communities (health issues from wastewater, costs for supplying water)</li><li>- Green Infrastructure/Stormwater</li><li>- Climate Change Adaptation</li></ul> <p>Identify and Discuss New Emerging Issues or Comment Opportunities Identify Vacancies in Membership and Interested Parties</p>	<p><b>National Ground Water Strategies Advisory Committee Meeting</b> Committee Chairs: <b>Kevin Frederick</b>, Wyoming DEQ &amp; <b>Andy Tolman</b>, Maine Drinking Water Program</p>
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~ Dedicated to Protecting the Nation's Ground Water ~

Wednesday, September 29			
Room: Reflections & Waterfront			
7:00- Registration & Morning Reception in Exhibit Hall <i>Sponsored by: ExxonMobil</i>			
8:00-10:00 Morning Sessions			
Water/Energy Sustainability Symposium Tracks			GWPC Annual Forum Tracks
<b>Room: Grand Station 1&amp;2</b> Session Staff: Steve Musick <b>Water Needs for Emerging Energy Technologies</b> Moderator- Victoria Pebbles, Great Lakes Commission	<b>Room: Admiral</b> Session Staff: Dan Yates <b>Energy for Water</b> Related Posters: 38, 69, 107 Moderator- Allan Hoffman, US DOE, Energy Efficiency & Renewable Energy	<b>Room: Grand Station 5</b> Session Staff: Paul Jehn <b>Water Utilities</b> <i>Saving Water/Energy Resources</i> Related Posters:123 Moderator- Art Hartstein, IBM	<b>8:00-9:00</b> Session Staff: Mary Musick <b>Room: Grand Station 3&amp;4</b> <b>Joint Water Availability &amp; Sustainability/Water Quality Session</b> <i>Climate Change Adaptation</i> Moderator- Jim Taft, ASDWA
<b>8:00-8:20 Abstract 7</b> Managing Renewable Energy Variability with Water – Tom Grabowski, Horizon Energy Group	<b>8:00-8:20 (full paper avail.) Abstract 149</b> Evaluating Green Energy Options at Water and Wastewater Treatment Facilities - Fred Bloetscher, Florida Atlantic University	<b>8:00-8:20 Abstract 65</b> Research to Help Drinking Water Utilities Optimize Energy Use - Linda Reekie, Water Research Foundation	<b>8:00-8:20 Abstract 98</b> Assessing Water and Carbon Footprints for Green Water Resource Management - Y. Jeffrey Yang, USEPA ORD
<b>8:20-8:40 Abstract 110</b> Analysis of Biofuel Production Scenarios and Their Regional Water Quality Impact – at the Upper MS River Basin May Wu, Argonne National Lab	<b>8:20-8:40 Abstract 12</b> The Nexus of Asset Management and Energy Efficiency/Management - Heather Himmelberger, Environmental Finance Center New Mexico Tech	<b>8:20-8:40 Abstract 111</b> Sustainable Wells: Role of Well Rehabilitation and Maintenance in Conservation - Stuart A. Smith, Smith-Comeskey Ground Water Science LLC.	<b>8:20-8:40 Abstract 103</b> EPA's Climate Ready Water Utilities Activities - John Whittler, Water Security Division U.S. Environmental Protection Agency
<b>8:40-9:00 Abstract 112</b> Water Use in Utility-Scale Solar Power Systems – Jordan Macknick, National Renewable Energy Laboratory	<b>8:40-9:00 Abstract 37</b> Energy Efficiency Best Practices for Drinking Water Utilities - Vanessa M. Leiby, The Cadmus Group, Inc	<b>8:40-9:00 Abstract 67</b> Energy Conservation Measures for Municipal Wastewater Treatment and Case Studies of Innovative Technologies and Practices - Laura Dufresne, The Cadmus Group, Inc.	<b>8:40-9:00 Abstract 92</b> Water Supply Reliability for Energy Development Demands: Adaptation for Potential Climate Change – Andrew Wolfsberg, Los Alamos National Laboratory
<b>9:00-9:20 Abstract 106</b> Algae as a Transportation Fuel: Research Direction and Initiatives – Mike Hightower, Sandia National Laboratories	<b>9:00-9:20 Abstract 61</b> From Awareness to Implementation: How to Specify Energy Efficiency in Treatment Facility RFPs - Jess Burgess, CEE Municipal Water-Wastewater Initiative	<b>9:00-9:20 Abstract 79</b> Water Efficiency at Public Power Utilities - J.P. Blackford, Environmental Services Engineer at the American Public Power Association	<b>9:00-10:00</b> <b>Room: Grand Station 3&amp;4</b> Session Staff: Steve Musick <b>GWPC Water Availability &amp; Sustainability Division Meeting</b> <i>(open to everyone)</i> Division Chair- Jamie Crawford, MS DEQ <b>Abstract 181</b> USGS National Water Census Groundwater Resources Program - Susan S. Hutson, USGS and Eric J. Evenson, Water Census Coordinator, USGS -open discussion
<b>9:20-9:40 Abstract 20</b> GIS-Based Water Resource Geospatial Infrastructure for Oil Shale Development - Wei (Wendy) Zhou, Colorado School of Mines	<b>9:20-9:40 Abstract 130</b> Finding Funding for Energy Efficiency Improvements at Water Utilities - Jonathan Gledhill, Policy Navigation Group	<b>9:20-9:40 Abstract 104</b> Case Study of Energy Efficient, Sustainable Improvements and Technologies Implemented at Water Treatment Plants - Andrew L. Casolini Dal Bo, Wendel Companies	
<b>9:40-10:00 Abstract 94</b> Potential Geochemical Releases to Groundwater from an In-situ Oil Shale Retort - Earl D. Mattson, Idaho Nat. Lab.	<b>9:40-10:00 Abstract 84</b> Water Energy Relationship - Arvind Akela, CDM	<b>9:40-10:00 Abstract 143</b> Accounting for the Carbon Costs of Alternative Water Supplies in the Tampa Bay Region - M. Jennison Kipp, University of Florida	
<b>10:00-10:20 BREAK in Exhibit Hall (Reflections &amp; Waterfront)</b>		<b>Grand Station Ballroom Foyer</b> <b>Poster Session: Abstracts: 69, 53, 115</b>	
			Session Staff: Ben Grunewald

Wednesday, September 29

10:20- 12:00

Mid-Morning Sessions

*Water/Energy Sustainability Symposium Tracks*

*GWPC Annual Forum Tracks*

Room: Grand Station 1&2  
Session Staff: Paul Jehn  
**Produced Water and Power Plant  
Discharge Water for Reuse**

Room: Admiral  
Session Staff: Dan Yates  
**Energy for Water (continued)**

Room: Grand Station 5  
Session Staff: Steve Musick  
**Water Availability & Sustainability**  
*Allocation Implementation of  
Water Rights/Laws*

Room: Grand Station 3&4  
Session Staff: Mary Musick  
**Water Quality**  
*Green Projects*

Related Posters: 128  
**Moderator- Sandra McSurdy**, NETL

**Moderator- Allan Hoffman**, US DOE,  
Energy Efficiency & Renewable Energy

**Moderator- Andy Tolman**, Maine Drinking  
Water Program

**Moderator- John Barndt**, Delaware Dept.  
of Natural Resources & Envi Control

10:20-10:40 Abstract 5  
Water Disposal, Emissions and Renewable  
Energy in the Oilfield – **Chris Jahn**,  
Purestream Technology

10:20-10:40 Abstract 13  
The Energy-Water Nexus in Texas - **Amy  
Hardberger**, The Environmental Defense  
Fund

10:20-10:40 Abstract 28  
Water Rights and Water Wrongs: Balancing the  
Interests of the Individual and the State in Water  
Allocation - **Francine Rochford**, La Trobe  
University School of Law

10:20-10:40 Abstract 117  
Beyond Clean Water: The Triple Bottom Line  
Benefits of Green Stormwater Infrastructure -  
**Matthew Vanaskie**, CDM Water Resources

10:40-11:00 Abstract 50  
Considerations for Use of Produced Water at  
Coal-Fired Power Plants – **David Alleman**,  
ALL Consulting

10:40-11:00 Abstract 70  
Sustainable Use of Hydropower in a Drinking  
Water System - Pittsfield, MA - **Christian  
Murphy**, AECOM

10:40-11:00 Abstract 118  
Developing a Sustainable Water Supply Strategy  
for the City of Plantation, Florida - **Courtney  
Licata**, Hazen and Sawyer, P.C

10:40-11:00 Abstract 49  
Application of the Energy Service Company  
Model to Green Stormwater Infrastructure in  
Philadelphia - **Matthew Condiotti**, CDM

11:00-11:20 Abstract 64  
Water Recovery, Recycling, Environmental  
Mitigation/Alternative Use of Brackish Coal  
Bed Methane Produced Water for Production  
and Well Completion Purposes - **Allan R  
Sattler**, Sandia National Lab.

11:00-11:20 Abstract 86  
Memorandum of Understanding for  
Hydropower - **Michael R. Gabaldon**,  
Director, Technical Resources, Bureau of  
Reclamation

11:00-11:20 Abstract 11  
Managing Groundwater on the Texas High Plains:  
Is Local Government Control Effective in  
Managing Regional Groundwater Resources? –  
**Sherry Stephens**, High Plains Underground  
Water Conservation District

11:00-11:20 Abstract 178  
Recovery Act Financing for Ground Water  
Systems – **Chuck Job**, USEPA

11:20-11:40 Abstract 77  
Use of Produced Water from the Illinois Basin  
by Coal-Based Power Plants – **Chad  
Knutson**, University of Illinois Urbana-  
Champaign

11:20-11:40 Abstract 6  
Counting What Counts: Energy Audits and  
Efficiency Programs for Water Utilities and  
End Uses - **Cat Shrier**, Watercat Consulting,  
& **Shahid Chaudhry**, California Energy  
Commission

11:20-11:40 Abstract: 63  
Groundwater Withdrawal and Regulations in the  
Eastern United States - **Brandon Kernen**, New  
Hampshire Department of Environmental Services

11:20-11:40 Abstract 138  
Revised Rhode Island Stormwater Manual  
Incorporates Ground Water Protection  
Practices – **Mark E. Nelson**, Horsley Witten  
Group

11:40-12:00 Abstract 129  
Pilot-Scale Constructed Wetland Systems for  
Treating Energy-Produced Waters - **James  
W. Castle**, Clemson University

11:40-12:00 Abstract 148  
Making WaterSense – EPA Activities to  
Address the Energy/Water Nexus - **Maura  
Browning**, EPA, OGWDW

11:40-12:00  
**Open Discussion**

11:40-12:00  
**Open Discussion**

Room: Reflections & Waterfront  
12:00-1:10 – Networking Lunch in Exhibit Hall  
*Sponsored by: Chesapeake Energy*

Grand Station Ballroom Foyer  
Poster Session: Abstracts: 75, 128, 107  
Session Staff: Ben Grunewald

Wednesday, September 29

1:10-5:50 Closing Sessions

Room: Grand Station 1&2 Session Staff: Paul Jehn  
1:10-3:00  
**Water and Unconventional Natural Gas Production  
Regulatory / Policy Consideration and Initiatives**  
Moderator- **Bob Sandilos**, Chevron & State Review of Oil & Natural Gas Environmental Regulations (STRONGER) President

Room: Grand Station 3&4 Session Staff: Steve & Mary Musick  
1:10-3:00  
**Ground Water Quality and Availability and Sustainability  
Regulatory / Policy Considerations and Initiatives**  
Moderator- **Jamie Crawford**, MS DEQ, & **John Barndt**, Delaware Dept. of Natural Resources & Environmental Control

1:10-1:30 Abstract 151  
Louisiana Haynesville Shale Model: Finding Success through Development of Flexible Institutions and Balanced Adaptive Water/Energy Management - **Gary M. Hanson**, Red River Watershed Management Institute Louisiana State University in Shreveport

1:10-1:30 Abstract 36  
Considerations for Implementation of the Underground Injection Control (UIC) Program for Carbon Dioxide Geologic Sequestration (GS) Wells - **Jill Nogi**, and **Mary Rose Bayer**, US Environmental Protection Agency

1:30-1:50 Abstract 34  
Natural Gas Development in the Susquehanna River Basin - **Jennifer Hoffman**, Susquehanna River Basin Commission

1:30-1:50 Abstract 179  
Contaminants in Groundwater Sources Used for Public Supply - **Patty Toccalino**, USGS

1:50-2:10 Abstract 18  
Hydraulic Fracturing and Drinking Water Resources – **Robert Puls**, USEPA - Robert S. Kerr Environmental Research Center Ground Water and Ecosystems Restoration

1:50-2:10 Abstract 62  
Unregulated Drinking Water Initiative for Environmental Surveillance and Public Health - **Lorraine C. Backer**, Team Lead and Senior Scientist, National Center for Environmental Health, Center for Disease Control and Prevention

2:10-2:20 Abstract 107  
The RBDMS National Oil and Gas Data Portal - **Stan Belieu**, NE Oil & Gas & GWPC Vice-President

2:10-2:30 Abstract 48  
National Groundwater Monitoring Network- Pilot Studies- **Daryll Pope**, New Jersey Water Science Center, US Geological Survey

2:20-3:10  
**Panel – federal, state, & local regulatory update**  
Moderator- **Lori Wrotenberry**, OK Corporation Commission  
• **Ann Codrington**, USEPA Office Of Ground Water & Drinking Water  
• **David Neslin**, Colorado Oil & Gas Conservation Commission  
• **Jim Weaver**, Tioga County Planning Department

2:30-2:50 Abstract 180  
Evaluating Sustainability of Projected Water Demands under Future Climate Change Scenarios – **Sujoy B. Roy**, Tetra Tech

2:50-3:10  
**State Crystal Ball—Where Do We Go From Here?**  
*Climate Change Adaptation  
Protecting Drinking Water Supplies (Public and Unregulated)*

3:10:3:20 BREAK in Exhibit Hall (Reflections & Waterfront)

**Scholarships Sponsored by: Range Resources**

**Student Event Scholarship Recipients:**  
Ashlynn Stillwell – University of Texas  
Mindy Haulman - Duquesne University  
Seth Sheldon – University of Massachusetts  
Jenica Lee – Kalamazoo College  
Xuexiang He - University of Cincinnati  
Jessica Wilson – Carnegie Mellon University  
Rachel Frohman – California University of Pennsylvania  
Miguel Pelaez – University of Cincinnati  
Changseok Han - University of Cincinnati  
Rachel Michael - Duquesne University

**Local Gov/Advocacy Scholarship Recipients:**  
Rick Torix – Oklahoma Marginal Well Commission  
Joe Osborne – Group Against Smog & Pollution  
Zelda Curtiss – Nine Mile Run Watershed Association  
Mark Isaacson – Green County Combined Health Dist. Xenia OH  
Ted Popovich – Group Against Smog & Pollution  
Jim Weaver - Tioga County, PA  
Ned Mulcahy – Three Rivers Waterkeepers

Wednesday, September 29

Closing General Session

3:20-5:50



Room: Grand Station 1&2

Session Staff: Mike Paque

3:20-5:50

*Moving Forward – Emerging Water, Energy, and Climate Change Adaptation Considerations*

Moderator- Joe Lee, Pennsylvania Department of Environmental Protection & GWPC President

Perspective of Water, Energy and Climate Change

3:20-3:40 Coal, Natural Gas, Climate & Water: Towards the Right Mix for Colorado, **Kristen Averyt** – NOAA Western Water Assessment **Abstract 113**

3:40-4:00 The Environmental Costs of Energy: A Discussion of the Trade-offs Involved in Energy Choices, **J. Daniel Arthur**, ALL Consulting **Abstract 170**

4:00-4:20 Adding Water to the Energy and Economic Equation - **Valerie Strassberg**, Nature's Voice Our Choice, Water/Energy **Abstract 114**

4:20-4:40 Energy Security: Water, Land, and Climate Change Adaptation – **Mike Hightower**, Sandia National Laboratory **Abstract 95**

Policy Strategies for Going Forward

4:40-5:00 US DOE Efforts to Broaden the Understanding of the Energy- Water-Climate Nexus - **Craig Zamuda**, Office of Climate Change Policy and Technology Office of Policy and International Affairs U.S. Department of Energy **Abstract 158**

5:00-5:20 Water, Energy, Climate Change Legislation-- **Josh Johnson**, Senate Committee on Energy and Natural Resources **Bio 189**

Wrap-up: Water, Energy and Climate Change Adaptation

5:20-5:40 Water-Energy Nexus: Strategic Thinking – **Dr. Carey King**, University of Texas **Abstract 9**

5:40-5:50 GWPC Role... Final wrap-up **Joe Lee**

Room: Reflections & Waterfront

6:00-7:00

*Post Conference Reception*

*On behalf of the GWPC Board of Directors and the Conference Planning Committee, THANK YOU For Your Participation!*

**GWREF Board of Directors**



David Bolin, Alabama State Oil and Gas Board

Jamie Crawford, Mississippi Dept. of Environmental Quality

Stan Belieu, Nebraska Oil & Gas Conservation Commission

Acknowledgements: 2010 Water/Energy Event Sponsors and Contributors



Microbial Control



On behalf of the Symposium Planning Committee... **THANK YOU!**



# Upcoming GWPC Events

## Fall RBDMS Training

Hampton Inn & Suites Albany  
Downtown  
25 Chapel Street, Albany, NY 12210  
**October 13-14, 2010**



Radisson Downtown  
1<sup>st</sup> and Congress

### 2011 UIC Conference

Underground Injection  
Control

THE National Ground  
Water Protection  
Program

Austin Texas  
January 24-26, 2011



*“Dedicated to protecting  
the nation’s  
Ground Water”*

## Ground Water Summit May 1-5, 2011 ~ Baltimore, MD



2011 NGWA Ground Water Summit and  
2011 Ground Water Protection Council Spring Meeting

Baltimore, Maryland  
May 1-5

## 2011 Ground Water Protection Council Annual Forum

September 2011  
Details ~ COMING SOON!

*Ground Water  
Availability  
& Sustainability*

*Water Energy  
Sustainability*

*Ground Water  
Protection*