Wisconsin Ground Water Association Newsletter

President's Message

The Wisconsin Ground Water Association Annual Meeting was held on March 19, 2010 at the Marriott Conference Center in Waukesha. The meeting, entitled ***Ground Water Resources and Applied Science in Wisconsin***, was attended by approximately 65 professionals representing industry, the consulting community, government, and academia. The all-day event was filled with eleven presentations from the public and private sectors, two student presentations, and four student poster presentations. Jim Bannantine (President – Elect), Paula Richardson (Past -President), Becky Caudill (Treasurer), Mike Raimonde (Director), and Aaron Schneider (Regional Director) joined me in planning and organizing the event.

Dr. J. Val Klump, Director of the Great Lakes Water Institute, entertained our record audience with the keynote presentation entitled "***Freshwater: Challenges to a Sustainable Future***" over lunch. Dr. Klump's presentation focused on global water resources by emphasizing research and projections of quantity and quality, pollution growth, and climate change. Based on current projections and consumptive water use, approximately 84 percent of the estimated total renewable available water will be consumed by the world's population by 2025. Please look for Dr. Klump's presentation, as well as all of the other presentations, on the WGWA web.

The following students (look for their photos elsewhere in this newsletter) received awards and monetary gifts for their contributions to the Annual Meeting:

Platform Presentations:

Mr. Scott Johnson and Mr. Ryan Leaf – University of Wisconsin – Madison

Poster Presentations

Ms. Kallina Dunkle – University of Wisconsin – Madison
Mr. Adam Krieger, Mr. Raymond Johns, Mr. Shane Peterson, Ms. Crystal Nickel, and Ms. Taylor Crist – University of Wisconsin – Eau Claire

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INSIDE THIS ISSUE:

The newsletter is published four times per year. If you have any suggestions or submissions, please contact us at: Wisconsin Ground Water Association, c/o Troy Thompson, W174 N7507 Joanne Drive, Menomonee Falls, WI 53051. Email: wgwainfo@wgwa.org; Web site: http://www.wgwa.org. The deadline for submissions to the 2nd quarter of 2010 newsletter is June 15, 2010.

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Our dedicated and enthusiastic Board of Directors has been very busy of late planning events and seminars that we are confident will provide opportunities for professional and personal development to our members. These events include:

- The WGWA Lecture Series will continue on May 4, 2010 with a luncheon seminar at the Reinhart Conference Center in Pewaukee, Wisconsin. Our keynote speakers, Mr. Donald P. Gallo and Ms. Carolyn A. Sullivan of Reinhart Boerner Van Deuren, S.C., will be speaking on the topic of "***Wisconsin's Public Trust Doctrine: Overview and Potential Water Law Revisions***". Please look for the announcement and invitation of this event on the WGWA web page.

- The next WGWA Lecture will be held in July at a yet-to-be-decided location. Dr. Katherine R. Grote, Assistant Professor of Geology at the University of Wisconsin – Eau Claire, will be speaking on the topic of "***Use of Geophysics for Environmental and Geotechnical Applications***". The announcement and invitation for this event will be posted on the WGWA web page as soon as a date has been selected.

Thank you for your interest and support of WGWA. We are always looking for new and creative ideas to grow and service our membership and welcome your thoughts and feedback.

Respectfully,

James F. Drought, P.H.
WGWA Present
(414) 291-2362
James.drought@shawgrp.com

2010 WGWA Annual Meeting Recap

By **Troy Thompson**

The 2010 WGWA Annual Meeting, titled *Ground Water Resources and Applied Science in Wisconsin*, held on March 26th saw one the best levels of attendance for an annual meeting in years. It included a good mix of professionals from industry, academia, and government as well as undergraduate and graduate students from five different schools. It was also held at a new venue: the Marriott Waukesha West on County F just north of I-94. It included an interesting range of presentations, some great food, and a good chance to get together with colleagues from a variety of areas.

The Meeting included eleven technical presentations, a Keynote presentation, four student poster sessions, a panel discussion, and some good after meeting drinks and discussion (or so I imagine as the author could not be there for that). While the Meeting had an overall theme, most of the talks also clustered around one or more sub-themes by chance.

Most of the talks focused on some aspect of groundwater contamination. Two presentations looked at the results of a recent Wisconsin DNR study on the effectiveness of the DNR's closure protocols. Terry Evanson of the DNR described the results of the study which re-looked at site conditions at a number of closed sites several years after receiving closure. Terry indicated the results appeared to suggest that data on site conditions at closure underestimated the remaining extent of contamination or the effectiveness of the chosen remedial method. David Swimm of the Wisconsin Department of Commerce presented a contrasting discussion of the study methodology and an interpretation of the results arguing that they were not as discouraging as the report concluded.

Two presentations looked at the hydrogeological characterization and natural attenuation variability at contaminated sites. Jim Bannantine of Geosyntec presented evidence that some of our common assumptions about contaminant migration may be flawed, and consequently, our conventional site investigation approaches may be improperly designed. John Roberts of ERM showed how spatial and temporal variations in natural attenuation may not be properly defined in typical investigation and monitoring programs. A subtheme of these two presentations and the prior two was the critical importance of properly designed and executed investigations.

Three presentations looked at less conventional or emerging groundwater contamination issues. A

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presentation by Scott Johnson, a graduate student at UW -Madison, examined possible nutrient loading sources affecting a lake in Door County. Dr. Xangping Xu of the UW-Milwaukee provided the results of studies showing that common agricultural practices may be creating antimicrobial-resistant bacteria that could threaten groundwater. Dr. Joe Piatt of Carroll College described the results of studies on the distribution of pharmaceuticals in a variety of waste materials and environmental media and showed that their distributions varied widely, and how they appeared to be controlled by chemical, physical, and biological differences within the waste treatment processes and the media.

Two presentations looked at contamination potentially related to groundwater contamination, but in other media. David Nemetz of Newfields presented an overview of the ins and outs of properly characterizing contaminated soil vapors beneath a building. Jeff King of Gannett Fleming described a coal gas manufacturing site that resulted in groundwater and sediment contamination, and the expedited methods used for addressing the contaminated sediments.

Three presentations looked at more conventional hydrogeology. Dr. Kurt Thomsen of KOT Environmental Consulting described a low cost approach for groundwater resource analysis and mapping over a multi -county area. Andrew Leaf, graduate student at UW-Madison, described an attempt to use high resolution temperature profiling in municipal water supply well to identify groundwater flow and characterize an aquifer. Dr. Ken Bradbury of the Wisconsin Geological and Natural History Survey presented a talk on what every hydrogeologist should but may not know about how to properly collect and interpret vertical flow data. Dr. J. Val Klump¸ Director of the Great Lakes Water Institute, presented the keynote speech during lunch. He provided a fascinating overview of the water issues we face starting from a global perspective and focusing down to the Great Lakes.

Copies of the slides for each of the presentations can be viewed on the WGWA website.

Four poster sessions were presented by undergraduate students. Five students under Dr. Katherine Grote of UW -Eau Claire presented posters describing work on the factors influencing high nitrate levels in groundwater in Eau Claire County (Adam A. Krieger and R. Johns), and three-dimensional vadose zone characterization using ground-penetrating radar (GPR) and determination of GPR ground-wave penetration depth (Crystal L. Nickel, T. L. Crist, and S. M. Peterson). One student under Dr. Mary Anderson of the UW-Madison presented a poster on the use of well log analysis for creating hydrostratigraphic models and predicting groundwater flow paths (Kallina M. Dunkle). Each student received an award for their poster presentation.

Following the presentations a panel discussion consisting of Ken Bradbury, Joe Piatt, and Daniel Feinstein of the USGS and moderated by WGWA President Jim Drought of Shaw Environmental discussed a variety of topics with audience input.

Special thanks for planning and organizing the Annual Meeting go to President Jim Drought and Past-President Paula Richards of RSV Engineering, Inc. with support from the Annual Meeting committee: Jim Bannantine, Becky Caudill of Natural Resources Technology, Mike Raimonde, and Aaron Schneider of First Street Northwest. Lee Trotta gets a thank you for gamely acting as the PowerPoint slide remote control (hope your finger has recovered Lee).

Comings and Goings

Though the news is somewhat dated, WGWA would like to acknowledge that one of its staunchest supporters and scientific contributors has left Wisconsin to pursue new opportunities in a new locale in need of his expertise. John Jansen, formerly and most recently of Aquifer Science & Technology (a Division of Ruekert-Mielke), has relocated to the Fort Myers office of ENTRIX in Florida. John is a recognized expert in water-supply investigations and development, and his expertise will be put to good use in Florida. But Wisconsin and WGWA are a little diminished by his departure. In an era dominated by mapping out benzene plumes to parts per trillion, John harkened back to a day when the science of hydrogeological consulting was focused on locating, evaluating and developing ground-water supplies. His approach was to use all the tools available, such as geological mapping, geophysics, and photogrammetry, to synthesize an analysis of an area's water-supply potential and select well locations.

John was a long-time contributor to the WGWA Newsletter through his "From the Supply Side" column and an avid supporter of the Association. As individuals and an Association we wish him well in his new endevours. We have no doubt he will be successful.

Economic Opportunities in Water Technologies

On January 19, 2010, the Wisconsin Ground Water Association hosted a luncheon meeting at the Marcus Center for the Performing Arts. Thirty-five people were in attendance to hear the featured speaker, Mr. Rick Meeusen, CEO and President of Badger Meter. Mr. Meeusen is also the Co-Chair of the Milwaukee 7 Water Council, and it was in this capacity that he addressed the meeting. The Milwaukee 7 Water Council has a vision of "building the Milwaukee region into the world's water hub and water leader sustainability."

Mr. Meeusen had a personal "eureka" moment while visiting A. O. Smith a few years ago with an opportunity to share laboratory facilities. His realization that a company that manufactures water meters and one that manufactures water heaters would have natural opportunities to cooperate led Mr.Meeusen to explore the water-industry potential for southeastern Wisconsin. It seemed obvious that a city known for beer and tanneries, two "wet industries", would have the infrastructure already in place to promote the Milwaukee area as the world's water hub. So it was no surprise to find that more than 120 water-related companies are already located in the Milwaukee area; employing more than 20,000 people.

With Milwaukee being positioned to take the lead in water technology and advances, it may be fortuitous that the demand and depletion of the water resources are being recognized on a global scale.

As Rich Meeusen noted, the Prince of Orange Willem-Alexander (Billy Orange), in his capacity as Chairman of the United Nations Advisory Board on Water and Sanitation, wrote the forward to *Charting Our Water Future*, a visionary global water-supply planning document produced by the 2030 Water Resources Group. The report painted a sobering view of the current availability of freshwater on a global scale, which is cited as 4.3 trillion cubic meters. Unfortunately, there is a need for 4.5 trillion cubic meters of water, which is expected to increase to 6.9 trillion cubic meters by 2030. The demand for freshwater supplies in the future will undoubtedly be governed by policy and growth trends, but will also generate investment, jobs, innovation and new technology. The result is an enormous market for freshwater technology and Milwaukee is ideally positioned to take advantage of this opportunity.

Historically, Milwaukee was settled by German immigrants largely because of it's proximity to Lake Michigan and an accessible, abundant, high-quality supply of freshwater. The water was ideal for the burgeoning beer and tanning industries, which contributed to the growth of the city. Badger Meter began by supplying innovative meters for Milwaukee's early "wet industries". Currently, only a few of the many former beer makers and none of the tanneries remain in Milwaukee, but the water supply and water infrastructure remain in place and ready for use.

The Great Lakes hold 20% of the world's freshwater, while Milwaukee uses only 30% of its capacity for processing and supplying water. The Milwaukee 7 Water Council supports efforts to attract new, innovative "wet industries" to Milwaukee to take advantage of the city's water-supply capacity and unique location. Industries and jobs can already be supported and new technologies and innovations will result. This will also result in enormous economic gains for the region.

The Milwaukee 7 is driving the initiative for freshwater technology and innovation and aims for Milwaukee to be the leader in the coming freshwater economic boom. Milwaukee is already well positioned for this economic activity with available water supply, available water infrastructure and with institutions and companies supporting the freshwater effort.

A few early examples of business and innovation success include the following:

UW-Milwaukee – School of Freshwater Science – The first of its kind in United States
Veolia – One of the world's largest freshwater companies, already in Milwaukee (Jones Island)
Marquette University -- Water Law Classes
Milwaukee Area Technical College – Flow Lab
Smart Metering (Badger Meter) to conserve water use
Food Processing Industries

Rich Meeusen acknowledges that much more work needs to be done, but the strategy developed by the Milwaukee 7 Water Council and the cooperative attitude of the 120+ existing water businesses, should provide the support and incentives for new industry in the area.

WDNR Finalizes Changes to NR 800 Series

The Wisconsin DNR has finalized changes to the rule packages for NR 809 and NR 811 and creation of NR 810. The changes pertain to making the Rules consistent with changes in Federal drinking water requirements and to bring them up to date with current technologies and practices. The recommended rule packages have been forwarded to the WDNR Board for review and final adoption. More information can be obtain as described below.

We are pleased to announce that the final rule package has been posted and will be presented by Lee Boushon to Natural Resources Board at their April 28th meeting in Green Bay. A big thank you to all of you who contributed comments and input throughout the process.

The rule package can be found on the DNR web site. You can access it in one of two ways:

1. Go to http://dnr.wi.gov/org/nrboard/2010/April/04-10-3A1.pdf

2. Go to the DNR web site at http://dnr.wi.gov/
   a. Click on "Natural Resources Board" in the green column on the left.
   b. Click "Meeting Agendas & Agenda Items" in the green column on the left.
   c. Click "April 27 & 28, 2010" under Current Agenda
   d. Scroll down to Order of Business, Action Items and click and the first one "Request Adoption of Board Order DG-19-09"

Planning Ahead: the Next WGWA Field Trip

Please save the weekend of September 18-19 for the annual Wisconsin Groundwater Association Field Trip. The trip this year will be in eastern Wisconsin, with tentatively planned stops in the north Kettle Moraine and throughout the Fox Valley. Come for one day, or participate the entire weekend, to include an overnight camping stay at High Cliff State Park in the Appleton area!

Details to follow this summer and at upcoming WGWA meetings.

Is Declining Groundwater Storage Threatening Food Security in the United States and around the Globe?

New Observations of Major Groundwater Changes in California's Central Valley and Other Aquifer Systems

California's Central Valley ranks prominently among the world's most productive agricultural regions. While it accounts for less than one percent of all U.S. farmland, it represents one-sixth of all the irrigated land in the United States, and produces about one-quarter of all the food consumed in our nation. This vital agricultural region is dependent on life-giving irrigation from a combination of groundwater pumped from wells and surface water diverted from other regions. But California, like many other regions in the United States and around the world, has been consuming groundwater at an unsustainable rate, a situation exacerbated by drought. The effect on the water table can now be readily monitored from space. Unique measurements of Earth's surface mass variations provided by the NASA/German Aerospace Center Gravity Recovery and Climate Experiment (GRACE) satellites are giving scientists new insights into how climate change is affecting the global water cycle.

This news conference will focus on recent findings in ground water changes associated with drought, highlighting conditions in California, where GRACE indicates that the Sacramento and San Joaquin drainage basins, which include California's agriculturally important Central Valley and its major mountain water source, the Sierra Nevadas, shed about half the capacity of Lake Mead, the largest reservoir in the United States, in the past seven years. We will also present results on other significant groundwater changes taking place around the globe. Plans to integrate GRACE data into operational drought monitoring initiatives will also be discussed. GRACE's ability to directly "weigh" changes in water content provides an unprecedented view of changes in Earth's critical water cycle.

Waukesha council to decide on application for lake water

Aquifer not sufficient, report says

Waukesha - Pumping water from only shallow wells to supply daily demand of Waukesha residents and businesses would have a significant negative impact on the environment - reducing water flows in the Fox River and local creeks and lowering water levels in a large portion of the Vernon Marsh and other local wetlands, a new study concludes.

Relying on a shallow aquifer for all of Waukesha's needs is not sustainable because water levels would drop quickly from city pumping, and the impact would be more severe during droughts when the city would be withdrawing additional water to meet demand, according to the analysis by a consultant hired by the city.

Results of the shallow aquifer study, conducted by RJN Environmental Services LLC of Oregon, Wis., are included in a proposed application for the purchase of Lake Michigan water to be considered by the Waukesha Common Council on Thursday, Water Utility General Manager Dan Duchniak said.

The application asserts that buying Lake Michigan water, with a continued emphasis on water conservation efforts, is the only reasonable solution to the city's quest for radium-free water and less costly than wells or any combination of wells, river and quarry water.

If the council approves the application, Waukesha would be the first community to request a diversion of water out of the Great Lakes drainage basin under terms of a 2008 Great Lakes protection compact.

The application would first go to the Wisconsin Department of Natural Resources for consideration. The compact requires Wisconsin and each of the other seven Great Lakes states to approve an application to divert water out of the basin.

The latest draft of the city's application also considers an option - using a combination of shallow wells and lake water - not included in an earlier proposal.

This option is rejected as too costly, requiring a start-up investment of $238 million, compared with the $164 million estimate of implementing a lake-water only option.

In addition, such a plan would require blending water from the two sources prior to distribution to customers. Consequently, the city could not comply with a provision of the compact setting strict limits on the amount of non-lake water returned in the treated wastewater, Duchniak said.

The city currently gets more than 87% of its water from three deep wells pumping from a sandstone aquifer contaminated with radium and salt. The remainder comes from shallow wells. Water from two of the deep wells is treated to remove most of the radium and meet federal drinking water standards. Water from the other deep well is diluted with water from two shallow wells to meet the standards.

Waukesha must deliver safe drinking water, with no or greatly reduced radium levels, to its customers by the June 2018 deadline in a state court order. Continuing to take water from the deep sandstone aquifer will become more costly over time as the water level drops, requiring more energy to pump it to the surface. There is more radium and salt in water from deeper depths, requiring removal of larger concentrations of contaminants to meet federal standards.

Relying on only shallow wells would cost $184 million to implement, according to a revised estimate in the application. Using a combination of deep and shallow wells in the future would cost an estimated $189 million to construct.

The Great Lakes compact would require Waukesha to return almost all of the water that it buys to the lake as treated wastewater. The application proposes discharging wastewater to Underwood Creek near Blue Mound Road in Wauwatosa. The creek flows to the Menomonee River, a tributary of the Milwaukee River, which flows into Lake Michigan.

In the proposal, Waukesha forecasts an average daily demand of 10.9 million gallons after 2035. In 2009, the city's average daily demand was 6.8 million gallons.

Minutes of WGWA Board Meeting held January 14, 2010

Attendees: Paula Richardson, Jim Drought, Aaron Schneider, Andrew Solberg, Katherine Grote, Lee Trotta, Mike Raimonde, Jim Bannantine, Lori Huntoon, Becky Caudill

Previous Meeting Minutes: not addressed.

The Treasurer's Report: Becky indicated that we have approximately $2,000 in ready cash available; enough to cover the January session. Becky also indicated that the registration/renewal forms are on the website and will be sent out soon via email.

Upcoming Elections and Board Positions: The draft ballot has been sent and should be posted to website soon. Mike Raimonde indicated he was not sure off hand if there were any more board vacancies coming up but he would report back. There is still interest in having a student/university liaison on the board and there seems to be consensus that it should be someone fresh out of school. Paula suggested adding the position to the ballot. We will revisit the idea at the next meeting.

Newsletter: Jim has recruited Wayne Hutchinson to help out with the WGWA newsletter. Troy and Wayne are in the final stages of the latest newsletter. Anyone interested in contributing to Boyd's memoriam can send their contributions to Troy/Wayne.

July Seminar: The SE luncheon seminar event in July was a success and was very well attended. Take away: format/time frame appears to be conducive to professionals given the time constraints of the work day; maybe too much content in too little time.

Spring Conference: The spring conference is set to take place March 19, at the Marriott Milwaukee West. Jim has sent out a draft of the invite and is accepting critiques/ suggestions.

Mike Raimonde has put together a tentative schedule and is also accepting abstracts (10 slots in the current schedule for presentations). So far several abstracts have been received but we need more to fill the time slots. Jim indicated that he would like a PowerPoint file from the speakers in advance so that a handout of the presentations can be given out to attendees.

A reduced price for students was suggested; possibly $20. Katherine will be bringing students to present in the poster session (possibly a few more without posters). There has been some interest in a sponsorship/ scholarship program for students coming to the conference. Paula has already contacted Pace Analytical and On-Site Environmental. Katherine also suggested shortening/moving the poster session up a bit or having the students perform 2-5 minute presentation between abstract presentations. Could break things up a bit and might shorten up the day for those attendees not interested in staying late.

Jim/Mike/Paula/Becky will work on conference schedule and invite.

June 2010 Seminar: Katherine Grote is the tentative presenter for the June 2010 Luncheon Seminar event. The topic of the seminar would revolve around geophysics for environmental applications.

Fall Field Trip/Camping Event: Kallina Dunkle has been nominated to help coordinate the fall field trip which will take on a slightly different format this year. The field trip will be supplemented by a camping trip in the Northern Kettle Moraine and will include focused talk/stops in and around the Northern Kettle Moraine.

Social Media: Jim requested that Lee Trotta look into how WGWA could better utilize social media websites such as Facebook, Myspace, LinkedIn, Etc., to improve WGWA's visibility within the Water resources community.

NGWA Leadership Conference: Paula is tentatively planning to attend the NGWA 2010 Affiliate States Leadership Conference in Washington, D.C. NGWA will reimburse travel expenses, up to $1,000, to anyone designated by WGWA. Anyone interested in attending should contact Paula.

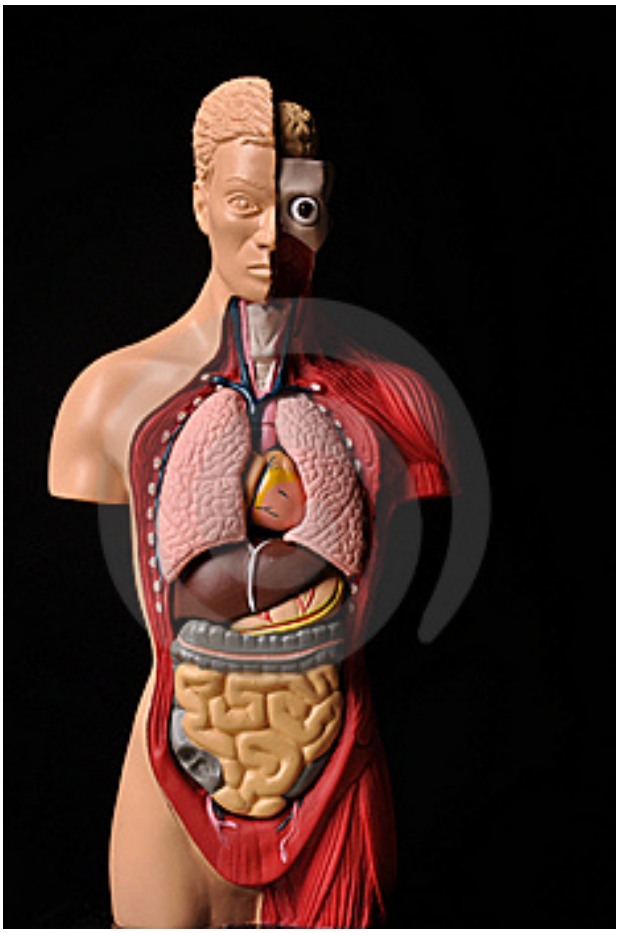
Paula will report back on her experiences during the subsequent WGWA board meeting.

Next Board Meeting: WGWA Spring Conference, March 19, 2010

Adjourned 1:08 pm

Treasurers Report January 1 to March 31, 2010

Account Name	Withdrawals	Deposits	Total
Certificate of Deposit			**$5,393.64**
Beginning Balance 01/01/10			$1,169.88
2010 Membership Dues		1,100.00	
NGWA Annual Membership	250.00		
Annual Conference 2010 Donation		695.00	
Annual Conference 2010 Registration		2,315.00	
January Luncheon 01/19/10 Registrations		120.00	
January Luncheon 01/19/10 Expenses	793.85		
Web Site and Newsletter Services			
Gift, Books, Bottles	922.05		
Expenses (Conferencing, Office, Postal, Bank, etc.)	64.75		
Ending Balance 03/31/10			$3,369.23
		All Funds Balance 03/31/10	$8,762.87



Water regulates the Earth's temperature. It also regulates the temperature of the human body, carries oxygen and nutrients to cells, cushions joints, protects organs and tissues, and removes wastes.

The 2010 Board, Committee, and Area Coordinators

President (2010)
James Drought
Shaw Environmental, Inc.
Phone: 414.291.2362; Fax: 414.291.2385
james.drought@shawgrp.com

President Elect (2011)
Jim Bannantine
Geosyntec Consultants
JBannantine@Geosyntec.com

Past President (2009)
Paula Richardson
RSV Engineering, Inc.
Phone: 920.674.3411; Fax 920.674.3481
prichardson@rsv-jefferson.com

Secretary (2009-2010)
Andrew Solberg
Leggette, Brashears & Graham, Inc.
Phone: 608.310.7675; Fax: 608.441.5545
Solberg@lbgmad.com

Treasurer/Membership (2008-2009)
Rebecca Caudill
Natural Resource Technology, Inc.
Phone: 262.522.1215; Fax: 262.523.9001
rcaudill@naturalrt.com

At-Large Board Members

Michael Raimonde (2006-2008)
Phone: 262.605.8320
m.raimonde@sbcglobal.net

Corey Pagels (2007-2009)
Leggette, Brashears & Graham, Inc.
Phone: 608.441.5544; Fax: 608.833.5551
pagels@lbgmad.com

James F. Drought (2008-2010)
Shaw Environmental, Inc.
Phone: 414.291.2362; Fax: 414.291.2385
james.drought@shawgrp.com

Katherine Grote (2009-2011)
University of Wisconsin-Eau Claire
Phone: 715.836.5485
grotekr@uwec.edu

Lori Huntoon (2009-2011)
Phone: 608.886.7245
madisontoons@gmail.com

Committee Chairpersons

Newsletter

Troy Thompson, Editor
T N & Associates, Inc.
Phone: 414.217.1541
troyrt@earthlink.net

Education Committee

Paula Richardson
RSV Engineering, Inc.
Phone: 920.674.3411; Fax: 920.674.3481
prichardson@rsv-jefferson.com

Ground Water Sand Model Reservations

Kathi D. Ried, P.G.
CH2M HILL
135 S. 84th Street, Suite 325
Milwaukee, WI 53214
Phone: 414.847.0464; Fax: 414.454.8818
Kathi.Ried@CH2M.com

Lori Rosemore
Ayres Associates
Phone: 715.834.3161; Fax: 715.831.7500
rosemorel@AyresAssociates.com

Web Site

Joan Viney
Phone: 608.836.3111
jviney@tds.net