

GEONews

Newsletter of the Association of Environmental & Engineering Geologists and
American Institute of Professional Geologists, Carolinas Sections



SPRING 2010

SAVE THE DATE!

*AEG Carolinas Section Meeting
APRIL 8, 2010 IN RALEIGH*

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Issue Date: March 21, 2010

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Cover Photo: *This photo is of an existing water source in the locality of the Engineers Without Borders Waspam, Nicaragua Project, the subject of the AEG Carolinas Section dinner meeting on April 8 See page 4 in this issue.*

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GeoNews is a publication of the Carolinas Section of AEG.

There are four issues per year, with deadlines and issue publication dates listed below. We publish news of the profession, technical articles, and **job** openings.

Deadlines for submittal to GeoNews (can be flexible depending on events)

Spring - deadline March 1, issue date March 21
Summer - deadline June 1, issue date June 21
Fall - deadline September 1, issue date September 18
Winter - deadline December 1, issue date December 21

Deadlines for submittals for the National AEG News:

March issue - January 21
June issue - April 30
September issue - July 31
December issue - October 31

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AEG National Website.....

	www.aegweb.org
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MESSAGE FROM THE CHAIR

By Paul Weaver, PG,
Carolinas Section Chair

Greetings to all from the Carolinas Section Chair. I hope this article finds you all weathering the economy as well as can be expected.

It was great to see such a large turn out at the meeting in Concord in February. I tried to get around and talk to as many people as possible, but it is kind of hard to do with such a large crowd. I do hope that, if we haven't had a chance to meet yet, you will come up and introduce yourself at the next meeting you attend so I can have a chance of getting to know as many of our members as possible.

For those of you who were not able to attend the February meeting, we had a special guest at the meeting, Steve Houser, and our featured guest and speaker, the AEG National President Duane Krueger. Steve Houser is middle school science teacher in Mecklenburg County and the winner of numerous science teacher awards. He spoke at the meeting about how we as earth science professionals can assist teachers like himself in educating the next generation about our profession. I spoke to Steve for a while before the meeting and he was genuinely excited to find out about all that AEG already does to assist science teachers, and even more excited to learn of our willingness to go into the schools to talk about earth science and what we do. If you haven't yet contacted a science teacher to offer some of your time to talk to their classes, I highly urge you to do so.

Duane Krueger gave a very informative talk about where environmental geology is at and where it's heading. I think Duane was very impressed with the turn out and the facilities. He also enjoyed the special cake!

On February 23 and 24, 2010, the Carolinas Section of AEG co-sponsored the Second Biennial Southeastern In Situ Soil and Groundwater Remediation Conference, held in Raleigh, North Carolina. An article describing the proceedings is on page 7.

I know that many of you are probably already tired of hearing about it but just in case you've been living under a rock (which, come to think of it, may not be too bad a place for a geologist to be), AEG Carolinas will be hosting the 2010 Annual Meeting in Charleston. We still can use all of the volunteers and sponsors and exhibitors we can get, so please give us some of your time and expertise to help make this the best Annual Meeting ever!

I hope you can all attend our April 8 section meeting in Raleigh. We plan to have speakers from Engineers Without Borders plus an encore presentation by Bonnie Ware with NCDENR. More details on the meeting are on page 4 of this newsletter..

As always, please feel free to contact me with questions, concerns, or ideas to help make the Carolinas Section of AEG even stronger. I look forward to seeing and meeting each of you at one of our quarterly section meetings.

Paul Weaver

Paul Weaver is Manager of the Transportation / Drilling department of Kleinfelder (formerly Trigon Engineering Consultants, Inc.) in Greensboro, NC.

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APRIL 8 SECTION MEETING WITH 3 (YES, 3) SPEAKERS

By Rick Kolb, Mactec

New Twists for our April 8 Section Meeting

Our section meeting in April will be a little different from last year. As you may remember, last year we met at the Carolina Ale House in Brier Creek, and except for the noise from the tables that were not supposed to be used, it was a great meeting, attended by over 80, many of which were students. The noise resulted from a breakdown of communication between the Ale House staff.

The manager to which we had spoken and reserved the room did not pass on our request for the entire seating area to his successors when he left the employ of the Ale House (he did not leave voluntarily). Therefore, our section decided to purchase a sound-amplification system, and be certain we had the entire outside seating area for the next meeting here. However, when we visited the Ale House in January to arrange this year's meeting, we discovered that the outside area had been partitioned into two rooms, separated by a glass wall. Although the manager to which we spoke (on his last day there) said we could have the entire area, we never received confirmation

from his successor of such an arrangement, so we made other plans.

Our spring meeting will therefore be held at the Fox and Hound Pub and Grill in North Hills Mall. The restaurant has a rectangular-shaped, private room, and this room is connected to a patio accessed only from our room and the outside, so we should have it pretty much to ourselves. We will provide two speakers and cordless microphone for the presenters, so you should have no problem hearing the presentations.

At this meeting we will have two presentations, the first about Engineers Without Borders and the second by Bonnie Ware, who had presented at our October meeting last year when we did not have the loft at Natty Greene's due to a scheduling error. Engineers Without Borders (EWB) is an international organization with over 300 chapters and 12,000 volunteers of all disciplines. At AEG's 2009 Annual Meeting, David Levine of the Las Vegas Chapter if EWB made a fascinating presentation about his work to establish potable and wastewater systems at an orphanage in Ghana. AEG invited David to speak because AEG is interested in establishing a partnership whereby AEG provides expertise in hydrogeology and EWB provides expertise the engineering for water and wastewater systems. Two members of the Research Triangle Park chapter of EWB will discuss EWB in general and will describe their chapter's project in Nicaragua.

Bonnie C. Ware will give a repeat of the talk she attempted to give in Greensboro last October, when we had no sound amplification, the Powerpoint slides weren't working, and the background noise made it almost impossible to hear what she was saying. We anticipate smoother sailing this time. To keep on the same 6:00 to 9:00 PM schedule we are used to, the EWB talk will start during dinner, at 7:30, and Bonnie's afterward, though as always you are welcome to come early. We anticipate being out again around 9:00 PM.

Bill's and Dave's Abstract and Bio:

Bill will present the history and origin of EWB National, based in Denver, Colorado (just like AEG), and the development of the RTP Professional Chapter, project priorities, how projects are chosen, and the general operation process for EWB projects. Dave is the Project Manager for the Nicaragua Project and will present specifics about the recent assessment trip to the Waspam area of Nicaragua. Our discussion will include what we intended to accomplish going in, how the assessment trip went, what was actually accomplished, and the road map for moving forward. Dave's presentation will be more detailed regarding engineering processes and results. A short question-and-answer session will follow the presentation.

Bio: **Bill Buckner** is President of Research Triangle Park Professional Chapter of Engineers Without Borders. He is a graduate of UNC Chapel Hill, where he received his degree in Business Administration in 1976 (no, he's neither a geologist nor an engineer). He was a Certified Pur-

(Continued on page 5)

AEG CAROLINAS SPRING SECTION MEETING THURSDAY, APRIL 8, 2010

Speakers and Programs:

Bill Buckner and Dave Miller, of EWB: Engineers Without Borders and the RTP Chapter's Nicaragua Project

Bonnie C. Ware, NC DENR: Playing Nice; Intra-Agency Communications (repeat talk, this time with a sound system)

Place: Fox and Hound Pub and Grill in North Hills Mall, Raleigh, NC

Date: Thursday, April 8, 2010

Time: 6 pm social, 7 pm dinner, 7:30 pm speaker

Directions: See page 5

Cost: Member/Non-member \$25;

Public Sector employees \$15

Students: FREE with college ID

Reservations: Please make reservations by 5pm on Monday April 5 with:

Rick Kolb, rkolb0915@aol.com,

Office 919.876.0416 | Direct 919.831.8054

Mobile 919.624.6362

or mail your reservation and check to:

Rick Kolb, MACTEC Engineering and Consulting, Inc. 3301 Atlantic Ave., Raleigh, North Carolina, 27604

PDH's: the SC Board of Registration for Geologists will offer 1 PDH for attending this event

(Continued from page 4)

chasing Manager in Energy Contracts & Procurement with Progress Energy for 24 years, as well as other area firms such as Nortel Networks and Black & Veatch over a career of 35 years. Currently Bill is Property Manager for Telamon Corporation in Raleigh. Bill also holds an NC General Contractor and Real Estate Broker's Licenses.

Bio: Dave Miller is a civil engineer for the City of Durham and a graduate of Virginia Tech in Civil Engineering. He is a Professional Engineer (Civil) in North Carolina.

Bonnie's Abstract and Bio:

For those of you who attended our fall meeting in Greensboro, you know Bonnie bravely attempted to present this talk without the benefit of any sound amplification. We know many of you could not hear her presentation, so we have offered her a second opportunity to present her talk in the capital city, near the heart of our beloved regulators, some of whom we hope will attend.

The recent re-organization of the North Carolina Department of Environment and Natural Resources (NCDENR) facilitated the need for enhanced intra-agency communications when addressing multiple projects with shared jurisdiction and incident management responsibility among the Departments within the Agency itself, as well as other government agencies and the private sector. This re-organization would change multiple aspects of environmental incident management within NCDENR. Through this re-organization and the work that has ensued have come a crash course on communications between departments within NCDENR as well as working with the EPA, additional state agencies, consultants, local municipalities and governments, and multiple forms of media and citizens.

Although not "scientific", the aspect of communications has come to light as playing a very instrumental and vital role in the progress of assessment and remediation of environmental incidents. Proper coordination of multiple agencies can assist project aspects such as funding, work force and timelines. Understanding the talents and limitations of individual agencies can greatly assist the consultant and or regulatory incident manager working with these environmental incidents.

Bonnie's presentation will present/discuss agency structures, organization and relationships. Common incident project scenarios will be worked through and explained allowing for open-floor discussions.

Bio: Bonnie C. Ware is a Hydrogeologist II for NCDENR. She initially joined NCDENR as a non-responsible party (non-RP) State Incident Investigator within the Division of Water Quality, Aquifer Protection Section. Once NCDENR reorganized, Bonnie attained the position as incident manager (Hydrogeologist II) within the Division of Waste Management, Inactive Hazardous Sites Branch under the Superfund Section.

She has worked in the private sector for ES&T (now a division of GES) and S&ME Greensboro. Bonnie is experienced in RCRA/CERCLA assessment, remediation, permitting and regulatory compliance; managing all

technical aspects of environmental projects that include assessment, analysis, remediation, project design, implementation, regulatory compliance, research and reporting. Her consulting experience allows her to provide cost-effective and timely solutions for complex environmental remediation projects and risk assessments. Bonnie is experienced with hydrogeologic assessments for various contaminants as well as for NCDENR permitting, and she maintains a thorough knowledge of the latest environmental regulations. She is responsible for large-scale and/or complex projects.

Bonnie joined NCDENR in 2006 with six years of prior consulting experience. She has a B.S. degree in Geology, specializing in Environmental and Hydrogeology from Virginia Polytechnic Institute and State University (Virginia Tech) in Blacksburg, Virginia. Bonnie has over 10 years of experience as a hydrogeologist.

She is married to Connel Ware, a Senior Project Manager with S&ME Greensboro and together they are the proud parents of two children, Brock and Sharon.

Bonnie is a member of the NCDENR Sustainability Team and the Division of Waste Management's Safety Team. She also enjoys community volunteering as a member of the Alpha Phi Omega Piedmont Alumni Association (a National Co-ed Service Fraternity) and giving talks to elementary school students about Geology and Environmental Sciences.

Directions to Fox and Hound Pub and Grill,

The restaurant is at 4158 Main At North Hills St, Raleigh, NC, in the North Hills Mall near the Starbucks. Their phone is (919) 781-4495. The mall is located at the intersection of the Raleigh Beltline (I-440) and Six Forks Road in north Raleigh. Take the Beltline to the Six Forks Road exit (no. 8), proceed north on Six Forks Road a few hundred yards, and turn left at the traffic light into the mall. Follow the entrance drive down into the underground parking garage and park. Take the elevator or steps up to the ground level. You can also park in the surface lots located on the eastern side of the mall (as you enter the mall) or on the western side of the Renaissance Hotel.

Thanks to our AEG Carolinas Section Sponsors, who are listed along with their contact information, on the last two pages of this edition of GeoNews. Please support them by sending them your business.

Remember that you could have your ad here for all our members to see. Check out the Sponsor or Advertising application on page 30 of this newsletter.

We would love to welcome you into our family of sponsors!

AEG CAROLINAS SECTION TREASURER'S REPORT-2009

By David Duncklee, Treasurer

**Association of Environmental & Engineering Geologists**

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Section Financial Report: FY 2009

Section: Carolinas

Balance on Jan 1, 2009:	\$ 17,605.92	Balance on Dec 31, 2009:	\$ 18,496.89
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SECTION INCOME

	First Quarter Jan-Mar	Second Quarter Apr-Jun	Third Quarter Jul-Sept	Fourth Quarter Oct-Dec	YTD Total
Section Dues		\$ 40.00	\$ 95.00	\$ 140.00	\$ 275.00
Subscriptions					\$ -
Meetings	\$ 1,295.00		\$ 405.00		\$ 1,700.00
Short Courses	\$ 5,355.00	\$ 20,625.00			\$ 25,980.00
Field Trips					\$ -
Publications and other sales					\$ -
Bank/Investment Interest				\$ 58.36	\$ 58.36
Contributions/Gifts/Sponsorships	\$ 3,452.00	\$ 6,075.00		\$ 4,837.85	\$ 14,364.85
Advertising: web & newsletter					\$ -
Other Income					\$ -
Accounts Receivable					\$ -
unaccounted					\$ -
TOTAL INCOME	\$ 10,102.00	\$ 26,740.00	\$ 500.00	\$ 5,036.21	\$ 42,378.21

SECTION EXPENSES

Meetings	\$ 1,860.08	\$ 2,063.17	\$ 711.41	\$ 993.36	\$ 5,628.02
Speaker Costs:		\$ 6,975.10			\$ 6,975.10
Short Courses		\$ 16,913.66	\$ 50.00		\$ 16,963.66
Field Trips				\$ 893.49	\$ 893.49
Publications				\$ 177.50	\$ 177.50
Advertising					\$ -
Printing, Postage: newsletter	\$ 553.24	\$ 1,594.82			\$ 2,148.06
Student Support	\$ 1,713.95	\$ 300.00	\$ 610.00	\$ 600.00	\$ 3,223.95
Donations to Others:				\$ 3,080.00	\$ 3,080.00
Merchandise Purchases: Science Kits Donated			\$ 97.20		\$ 97.20
Officer Expense Reimbursement	\$ 58.70			\$ 983.91	\$ 1,042.61
BOD Meeting					\$ -
Banking Costs		\$ 7.50	\$ 0.15		\$ 7.65
Public Information					\$ -
Lobbying/Political Outreach					\$ -
Other Expenses: web site & Charleston		\$ 775.00	\$ 475.00		\$ 1,250.00
unaccounted					\$ -
TOTAL EXPENSES	\$ 4,185.97	\$ 28,629.25	\$ 1,943.76	\$ 6,728.26	\$ 41,487.24
Quarterly Surplus (Deficit)	\$ 5,916.03	\$ (1,889.25)	\$ (1,443.76)	\$ (1,692.05)	\$ 890.97
FY Balance	\$ 23,321.95	\$ 21,632.70	\$ 20,188.94	\$ 18,496.89	\$ 18,496.89

I certify that the finances reported above are true and correct.

	1-Feb-10
Signature of Section Treasurer	Date

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I have audited the financial statement provided by the Section Treasurer

Signature of Section Chair	Date

SECOND BIENNIAL S.E. IN-SITU SOIL AND GROUNDWATER CONFERENCE

By Dave Duncklee, Duncklee & Dunham

On February 23 and 24, 2010, the Carolinas Section of AEG co-sponsored the Second Biennial Southeastern In Situ Soil and Groundwater Remediation Conference, held in Raleigh, North Carolina. Over 176 attendees heard speakers from across the US discuss the latest approaches to these types of innovative treatment technologies.

Multiple exhibitors were also present which pushed total attendance to over 200. The AEG Carolinas Section was represented by Mr. Rick Kolb and Mr. David Duncklee to drum up interest in the upcoming Charleston 2010 AEG National Meeting. Many thanks to Ms. Jane Gill-Shaler who prepared the conference flyer, to Ms. Tami Idol who sent out multiple email notifications to the membership, and others in the Carolinas Section and Denver who assisted with providing the booth and notifications to the national membership.



Susan Kelly and Rick Kolb, both of Mactec, at the AEG 2010 booth at the soil and groundwater conference, encouraging exhibitors, sponsors, and attendees.

AEG 2010 Annual Meeting in Charleston, SC CALL FOR ABSTRACTS

The Association of Environmental and Engineering Geologists (AEG) will host its 2010 Annual Meeting in historic Charleston, South Carolina Sept. 20 to 25, 2010. You are invited to submit a one-page abstract by April 1st. You have your choice of an oral or poster presentation at the Annual Meeting. Full papers are not required.

For abstract submission instructions and a listing of Technical Sessions and Symposia Topics, visit the AEG website at: www.aegweb.org and click on the meeting logo, or go directly to the abstract information link at <http://www.aegweb.org/i4a/pages/index.cfm?pageID=4877>. Check the Annual Meeting website for additional meeting details. Other features of the meeting include:

Field Trips:

From the Atlantic to the Appalachians, and Back!
Coastal Processes on Kiawah and Seabrook Islands, South Carolina
Environmental Remediation and History of the Savannah River Site
1886 Charleston Earthquake Walking Tour
Macroscopic Effects of the 1886 Charleston Earthquake

Short Courses:

FEMA/HAZUS Course
Introduction to Groundwater Chemistry
Intermediate Groundwater Geochemistry
Rock Core Description for Engineering and Environmental Purposes
Use of Geophysical Equipment
Practical Rock Slope Engineering

See you in September!

Please contact Meeting Manager, Heather Skladanowski, if you have questions or have interest in being an Exhibitor or Sponsor: meetings@aegweb.org, 303-830-6850. The AEG 2010 flyer is on pages 22-23.



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STAN RIGGS TO SPEAK AT JOINT GWPNC/AEG MEETING ON JUNE 17 2010

The Ground Water Professionals of North Carolina (GWPNC) announces their summer meeting, which will be held on Thursday, June 17 starting at 6:00 PM at the Little River Resort in Carthage, North Carolina. The Carolinas Section of AEG will co-host this meeting, which should be of interest to both environmental and engineering geologists as well as other scientists. Stan Riggs, Distinguished Research Lecturer in the geology department at East Carolina University, will be the guest speaker, and his talk is titled "From Fossil Fuels to the Oceans: A Plethora of Solar Energy."

Abstract: Ancient civilizations understood their dependence on the sun for light, warmth, and energy and consequently, had some form of sun god. The sun's daily cycle symbolized renewal and the paramount force of life. Apollo was the sun god for the Romans, Helios for the Greeks, and Tonatiuh for the Aztecs. The sun god of ancient Egypt, Ra, was the ruler of the heavens and earth. Thor Heyerdahl sailed his Egyptian papyrus raft (the Ra Expedition) across the Atlantic Ocean in 1969 utilizing the power of the sun.

"In any given hour, more energy from the sun reaches earth than is used by the whole human population in any given year" (B. McKibben, 2009). Solar energy is not only a fundamental source of life and fossil fuels on our planet, but it powers most of the physical processes associated with the hydrologic cycle driving our atmosphere (air), hydrosphere (water), and cryosphere (ice). These solar processes ultimately make our planet habitable. The potential sources of solar energy range from the lithosphere's fossil fuels to the planet's atmosphere and oceans, whose circulation systems are driven by solar energy.

This presentation will start with the conventional fossil fuels (coal, oil, gas, etc.) and hydroelectric power (rivers), and will then delve into future solar energy sources that go well beyond our present efforts to capture atmospheric wind and solar light. The real, future poten-

tial lies in that portion of our planet that covers 71% of the earth -- our oceans. These water masses are incredible stores of renewable solar energy that range from tidal currents and waves to the vast sources associated with oceanic currents (such as the Gulf Stream and Florida Current) and the temperature-stratified oceans or ocean thermal energy conversion (OTEC). The latter is the earth's greatest potential heat engine. Consequently, our energy future on planet earth is largely dependent upon society's willingness to understand the complex flow paths of our solar energy and our ability to tap into this system without serious negative consequences. There is more than enough energy to keep us going if we understand it and manage it properly!

The GWPNC meeting routine is just like our section meetings: social hour from 6:00 to 7:00, buffet dinner from 7:00 to 8:00, and the speaker from 8:00 to 9:00. Cost is \$25 for members and \$35 for non-members. Membership in GWPNC is only \$25, so a non-member can join GWPNC and pay the member dinner price of the net difference of \$15. You can make a reservation for the meeting by emailing Nichole Manning of Choice Environmental (one of our section's sponsors) at nichole@choice-enviro.com.

GWPNC ANNOUNCES 11TH ANNUAL GOLF TOURNAMENT

GWPNC announces their 11th annual golf tournament, to be held on Friday, June 18, GWPNC at the Little River golf course. GWPNC invites you to join 80 or so geologists and sponsors for a day of golf, associated malt beverages and after-golf dinner. Dave Duncklee and Rick Kolb have organized past GWPNC golf tournaments and can attest that you will have a good time. Expect to see prizes for closest to the pin and long drives, as well as door prizes. Further details will be posted on GWPNC's website at www.gwpnc.org or from contact Guy Veni of American Environmental Drilling, one of the Carolinas Section's sponsors, at guyv@aedi.biz.



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BIG DISCOUNT PACKAGES OFFERED FOR AEG 2010

As some of you may know, the AEG Advertising, Sponsorship, and Exhibitor (ASE) Committee has been working on putting together a slick brochure advertising AEG National's contribution opportunities packages. This brochure should be finalized before the Clemson meeting. Perhaps some of those can be given out as well. I'll keep you updated.

We've included a discount to all section sponsors. If the sponsor selects one of the "Exhibitor" or "Plus" packages, then AEG will discount the cost of these packages by the amount that the sponsor contributes to the section. For example, if company ABC is a Platinum sponsor of the Carolinas Section for \$500, and then decides to do the Platinum Plus Exhibitor package from National AEG, then they will get \$500 off of the \$5000 price of the national package. What a deal!

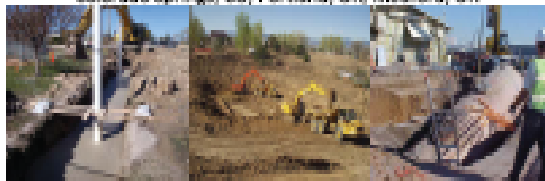
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Some of the local children in Nicaragua that Engineers Without Borders has helped obtain clean drinking water. See page 4 for details on the AEG Section Meeting.

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GEORAMBLINGS

By Dr. Charles W. Welby

History of Licensing of Geologists in North Carolina,
(continued.) February 22, 2010;

This third installment of the History of Licensing of Geologists in North Carolina brings the story (at least what I know of it) up to the actual formation of the Board for Licensing of Geologists. I have used information from Neil Gilbert's paper at the 2008 SE-GSA meeting in Charlotte honoring Stephen A. Conrad, and information from the Newsletter of the North Carolina Board for Licensing of Geologists, Fall 2009 edition, as supplementary materials to my notes and letters in my files to compile the following historical material.

As noted in the Winter 2009 edition of GeoRamblings, George Bain, President of the Carolinas Section of A.I.P.G., sent out a letter on May 4, 1983, summarizing the history of the development of the Geologists Licensing Act, and I noted that this bit of correspondence was the beginning of the "Voyage" toward the goal of passage of the Geologists Registration Act. The initial bill was submitted into the "hopper" of the General Assembly in May 1983. Work on the bill was carried over into the 1984 session of the General Assembly. George Bain with the guidance of the firm Johnson, Shearon, and Gamble and Stephen Conrad roamed the halls of the legislative building contacting appropriate legislators and committee

members during the 1983 and the 1984 sessions of the General Assembly. Finally on July 3, 1984, the bill establishing the Licensing of Geologists in North Carolina was ratified by both houses of the General Assembly and was later signed into law by Governor James B. Hunt.

The bill stated that for purposes of the appointment of the initial Board and administrative preparation for the implementation of the Act its effective date was July 1, 1983. For all other purposes it became effective January 1, 1985.

In August 1984 Samuel Johnson of Johnson, Shearon, and Gamble sent to George Bain as well as members of the Steering Committee an outline of the Geologists Licensing Act along with a request for any suggested changes to it to be considered in the 1985 meeting of the General Assembly. There is no record in my files of any requests for changes.

During the Fall of 1984 an effort was made to compile a list of potential appointees to the Geology Licensing Board by making a request for suggestions/nominations of candidates for consideration from all known geologists in North Carolina. On December 19, 1984, Stephen Conrad, State Geologist, sent a list of possible appointees to the Board to Paul Essex of Governor James B. Hunt's office. December was the last month of Governor Hunt's term of office, and there was no action taken on the request.

With the installation of James G. Martin as Gov-

(Continued on page 11)

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(Continued from page 10)

error in January 1985, the nomination process for members of the Geologists Licensing Board had to be started again. On January 21, 1985, Sam Johnson sent a memo to the Carolina Section of AIPG noting the February 5, 1985, convening of the General Assembly and the need for the geologic community to discuss technical changes to the Licensing Act, composition of the Board, organization and committee structure of the Association (AIPG) and whether or not a part-time director should be engaged. By this time George Bain was associated with a Virginia firm, but he maintained a residence in North Carolina also. The point was made that the geologists should be considering that others should pick up responsibility for dealing with the legislature in support of the Licensing Act.

After some discussion among members of the Steering Committee and others, Charles W. Welby, President of the Carolinas Section of AIPG sent a letter to Governor Martin noting the authorization of the Board for Licensing of Geologists in 1984 and that the Board was to assume its responsibilities on January 1, 1985. The letter also pointed out that Steering Committee had solicited nominations and suggestions for possible Board members from the North Carolina geologic community at large.

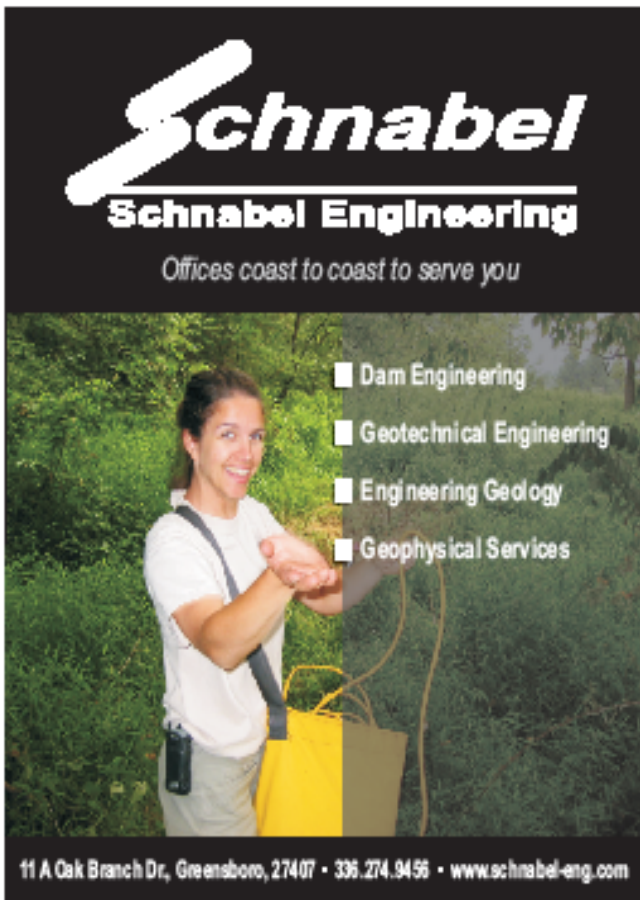
On or about April 15, 1985, George Bain and Charles Welby discussed some procedural matters and compilation of a new list of candidate appointees to be sent to Governor Martin. On April 18, 1985, a list of pos-

sible candidates was sent to George Bain and on April 25 short resumes of the candidates were also sent to him. On the same date Stephen Conrad, State Geologist, was provided the same list. On April 30 the same list and resumes were sent to Dudley Gwaltney of the Office of State Boards, Commissions, and Agencies in Governor Martin's office. The letter accompanying the information noted that the nominees were chosen in an open and fair process. Mr. Gwaltney acknowledged receipt of the lists in a letter on May 8.

The Board for Licensing of Geologists was appointed by Governor Martin with an effective date of August 15, 1985. The initial appointees were as follows:
 Ronald A. Crowson (Chair) - Mining Industry
 Neil J. Gilbert - Company Salaried
 John A. Callahan - Academic Institution
 Edwin A. Andrews III - Independent Consultant
 George C. Edmonson - Public Member
 Stephen A. Conrad, State Geologist - Ex Officio.
 The Board first met on October 4, 1985, and immediately began formulating its rules and regulations. These were adopted on December 17, 1985.

In its early actions the Board organizing the "Grandfathering" licensing process, the dates for this process being August 15, 1985 to August 15, 1986. Correspondence was prepared and sent out announcing that the forms for this process would be available on February

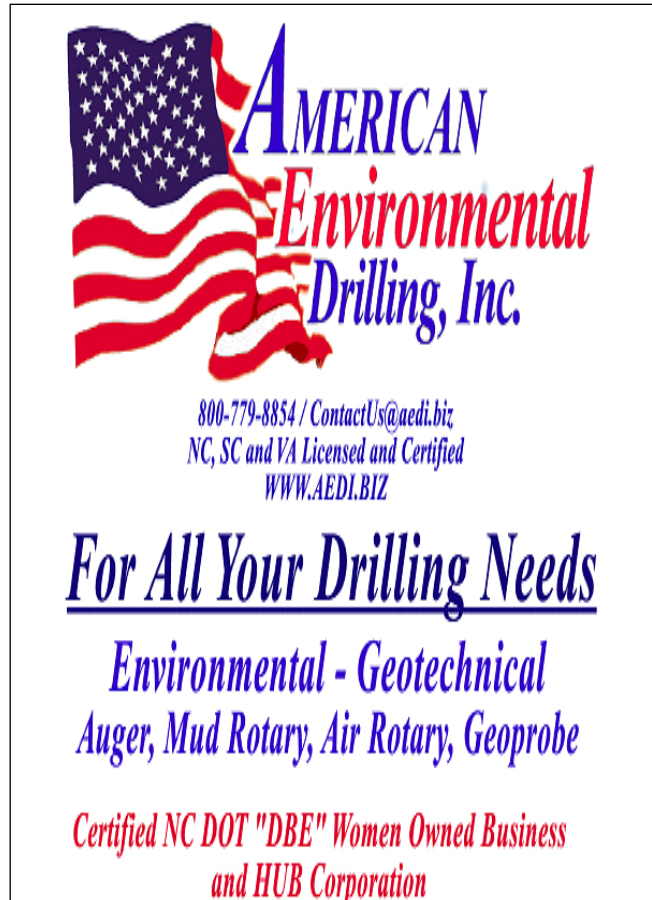
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(Continued from page 11)

15, 1986. In the early days of the Board there was financial support for postage and mailing materials from the professional geologic organizations.

The first licensing examinations were prepared “in house” by requesting questions from members of the geologic community and especially from geologists associated with the academic institutions in North Carolina. Eventually ASBOG was formed with the North Carolina Board being among the initial seven founders of ASBOG. The first ASBOG examination was developed for administration in 1994.

My notes indicate that there was another attempt at “sunsetting” licensing boards in 1992, but it appears, of course, that the Board for Licensing of Geologists survived that action.

And so the tale continues – and “Time Marches On.

Charles W. Welby

Dr. Charles W. Welby is a former Section Chair for AEG Carolinas and a regular contributor to this newsletter. He may be reached at cww_ral@hotmail.com.

PASSAGES: JOHN FETT, FETT INSTRUMENTS

*By Doug Canavello, Pyramid
Environmental*

John David Fett, owner and operator of John Fett Instruments, passed away on July 14, 2009. A memorial was published in the December 2009 AEG News.

John had many friends in the environmental/geotechnical industry, including the Carolinas. He was always available to help, answer questions, and keep us junior geologists and geophysicists on track. Although he was located in Texas, it always seemed to me like he was right next door.

John helped me, and I’m sure many others, as we decided what instruments to use in our upcoming geophysics projects. His voice was calm and deliberate and I could rely on him to recommend the best solution for my jobs (and find ways to keep in my budget).

I discovered a whole other side of John in the AEG News memorial which described his life of learning, teaching, and furthering the collection and understanding of applied geophysical data. He will be missed.

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TECHNICAL SECTION

SLOPE STRENGTHENING: Reducing the environmental impact of new construction

By James DeSpain, Russell Byrd, and Frank Amend

Environmentally friendly biotechnical engineering solutions are at the forefront in North Carolina's slope engineering. Slope strengthening which allows open drainage and vegetation growth has become the preferred solution in many projects.

This slope strengthening system is comprised of three (3) main components: soil nail reinforcement, alloy super-coated high tensile 3-dimensional (3D) hexagonal wire mesh, and a specially designed spike plate. Its design incorporates the ability of the system to transfer forces from the facing material to the spike plate and soil nail point, thus increasing cone angle and allowing a wider spacing of nail design, and increasing the overall



Uretek ICR Mid Atlantic, began the stabilization project with placement of soil nails in the slope face.

value of the system by a cost reduction over other alternatives.

During the final design and construction of the new police evidence storage facility in Winston-Salem, NC, the contractor, Davie Construction Company, based in Advance, NC, needed to ensure that the existing slopes to the rear of the building were stable enough for the building's refurbishment and paving of the parking areas. The building was an old textile warehouse and manufacturing facility that was gutted and then refurbished by the city instead of fabricating a new building.

Once Davie Construction began digging at the back side of the facility, they quickly found that the existing slopes were composed of un-compacted fill. They had to cut a service access road to maintain a sewer main, and this road had to be kept open and clear. Once the slope was cut into for this construction, it became apparent that the un-compacted fill was going to be unstable. This was

made especially obvious after a rainstorm that brought whole sections slipping down the slope onto the roadbed below.

An investigation into the hillside's soil composition found that mixed in with the un-compacted soil was also building rubble and trash accumulated over the years. In talking with the "old salts" in the department, Russell Byrd, Building Project Engineer of the City of Winston-Salem, learned from these city workers that the previous owners identified this as a "low" spot on the property and routinely dumped construction trash into the area as "fill".


With these findings known, it was clear that the slope's surface was in need of stabilization. Due to the project's quick turnaround time requirement and the original budget not taking this added action into account, several solutions were discussed, including shotcrete and a retaining wall. Analysis revealed the most cost effective and the least environmentally assaulting solution to be Geobrugg's TECCO® wire mesh slope stabilization system.

This system was chosen, in conjunction with soil nails, to provide stabilization for the embankment. The mesh solution would allow a pretension load to be placed on the mesh surface, acting as a compressive force to the slope surface to prevent failures.

Uretek ICR, Mid Atlantic of Kernersville, North Carolina, was selected to install the TECCO® system. First, the placement of the soil nails in the bank face was completed using a Con-Tech Titan Bar system and an excavator mounted rock drill unit. The Titan Bar soil nail system was chosen because it allowed the nail to be drilled and grouted at the same time; resulting in faster placement of the nails in a material that would not remain open for post grouting of holes. Where possible during the placement of the soil nails, existing vegetation was not removed. This facilitated plant re-growth on the slope surface after the mesh was installed.

Once the nails were placed and the grout had reached its curing strength, a three-ply geo-textile mat was

(Continued on page 14)



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A&D Environmental

TECHNICAL SECTION

(Continued from page 13)

unrolled over the ground and nails. Then the TECCO® mesh was stretched over the mat and nails before being secured to the nails using TECCO® spike plates installed over the soil nail bars. The geo-textile mat was secured at the top of the slope using the first “lift” of soil nails and just rolled down the hill over the slope face with an eight (8) inch overlap of rolls. The TECCO® mesh was installed similarly with a two (2) diamond overlap. The panels were secured together with compression claws, resulting in one large sheet of mesh covering the entire

slope.

It was important to install the TECCO® mesh as tightly to the slope surface as possible, allowing it to transfer the pretension load from the nails to the slope. Once the stretched TECCO® mesh was placed over the Titan Bars, TECCO® spike plates were used to anchor the mesh to the soil nails. The spike plates were placed through the bars’ threads, the washer/nuts were tightened onto the threaded bars, with the nut torque achieving a 7 kip preload. The entire slope’s spike plates were installed,

(Continued on page 15)



The critical step to stretch the TECCO® mesh over the geo-textile mat and soil nails.



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TECHNICAL SECTION

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then all checked again to make certain of the proper torque.

Once the TECCO® mesh was tightened, Uretek evaluated the need for additional nails to ensure the hill-side contour was followed and the mesh was stretched taut. When it was determined that additional nails were needed in specific areas, they were easily positioned with



Completed project after 6 weeks vegetative re-growth

the mesh already in place. The installation of nails through the TECCO® mesh allowed Uretek to also make certain the geo-textile mat was tightly placed over the slope contours, providing long-term stability of the surface layer.

A few high erosion spots on the site were recognized, which if left unattended, would have severely degraded the slope at these water discharge points. To reduce the impact of erosion in these areas, grout-filled permanent matting was installed below the discharge points to add extra protection in these spots. The project was completed in February, 2009. Photos show slope re-vegetation advancing already at the end of March.

For additional information, the authors of this article may be contacted at:

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TECHNICAL SECTION

WHY IS 10^{-6} USED AS AN ACCEPTABLE RISK?

By Bryson D. Trexler, Jr., Ph.D., P.G.
Senior Hydrogeologist
Duncklee & Dunham, P.C.

U.S. EPA and state agencies use 1×10^{-6} or one-in-a-million (10^{-6}) risk of developing cancer to establish allowable exposures to carcinogenic contaminants in groundwater, soil, air and other environmental media and cleanup levels for the contaminated environmental media. However, when you look in EPA and state agency documents there is no explanation of why 10^{-6} is used as an acceptable risk.

In a search on the internet, some insight into the development of 10^{-6} was found in a paper entitled *The Myth of 10^{-6} As a Definition of Acceptable Risk* by Dr. Kathryn E. Kelly of Delta Toxicology, Inc. (1991). Dr. Kelly conducted an extensive literature search of toxicological, medical, regulatory, pollution, environmental, and governmental databases back to the mid-1970s without finding written documentation. A telephone survey was then conducted within the environmental industry including state and federal agencies, private organizations, legislators, environmental law firms, and two former EPA administrators without any of those contacted agencies able to explain the development of the 10^{-6} concept.

Dr. Kelly eventually determined that the 10^{-6} number was an arbitrary number, finalized by the U. S. Food and Drug Administration (FDA) for a screening level of zero or *de minimus* risk in a 1973 Federal Register notice entitled *Compounds Used in Food-Producing Animals: Procedures for Determining Acceptability of Assay Methods Used for Assuring the Absence of Residues in Edible Products of Such Animals (proposed rule Federal Register, July 19, 1973, 19226-19230 (FDA 1973))*.

The number was based on a 1961 article by Nathan Mantel and Ray Brian of the National Cancer Institute (NCI) entitled *Safety Testing of Carcinogenic Agents: Journal National Cancer Institute*, 27, pp 455-470. Mantel and Brian had been asked by the Director of the NCI to develop guidelines for the number of laboratory animals required to establish the safety of a substance.

In the 1961 article, Mantel and Bryan pointed out that to define the parameters of safety testing, one

must first define safe. For the purposes of their discussion, they assumed safe is equal to 1 in 100,000,000 of developing cancer. Asked how he chose the number of 10^{-8} , Mantel replied, "We just pulled it out of a hat." Defining an actual "safe" was not the focus of their article.

The FDA used the 10^{-8} value in the original 1973 notice in the Federal Register, but changed it to 10^{-6} by the time the final rule was issued in 1977 (Federal Register 42: 10412-10437). "One in one million" was thus established as the "maximum lifetime risk that is essentially zero" or the level below which no further regulatory consideration would be given regarding the safety of residues of a carcinogenic animal drug. This is thought to be the ultimate origin of 10^{-6} (Kelly, 1991).

In the FDA legislation (FDA 1973), the regulators specifically stated that this level of "essentially zero" was not to be interpreted as equal to an acceptable level of residues in meat products. However, current environmental regulations and guidance documents have done exactly that: interpreted this "essentially zero" level developed by the FDA, a level below which there would be no regulatory consideration given regarding safety, as a maximum "acceptable" level of risk (Kelly, 1991).

How did the misconception arise that 10^{-6} was a legislative requirement? As the concept of risk assessment was broadened over two decades from carcinogenic animal drugs at the FDA to a host of other decisions and agencies (including food, water, air, hazardous waste, and others), the 10^{-6} concept was carried along as well. In the opinion of a former FDA counsel, the concept of 10^{-6} was repeated so often that it took on the stature of a firm regulatory policy, although the record clearly indicates otherwise. The original intent of 10^{-6} as a screening level was lost, and still is not recognized today (Kelly, 1991).



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TECHNICAL SECTION

(Continued from page 16)

The author of this article may be reached at:
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Editor's note: An email from a former colleague in California, a Senior Geochemist, indicated that the one-in-a-million was a useful estimate given the U.S. population at the time (~180 million in 1960). If a substance had a one-in-a-million risk of causing cancer over a lifetime of 70 years for an adult in the U.S. population, approximately 180 persons would contract the disease.

We may assume that a 10^{-1} risk would have been an unacceptable value because then 18 million people would contract cancer (such a substance probably would have more of an acute rather than chronic toxicity, e.g., cyanide) and using 10^{-10} might also be unacceptable because less than one person in the U.S. would contract cancer over a lifetime.

Therefore the one-in-a-million risk number ap-

pears to have satisfied those requirements for reasonably evaluating a chemical's toxicity in causing cancer over a lifetime.

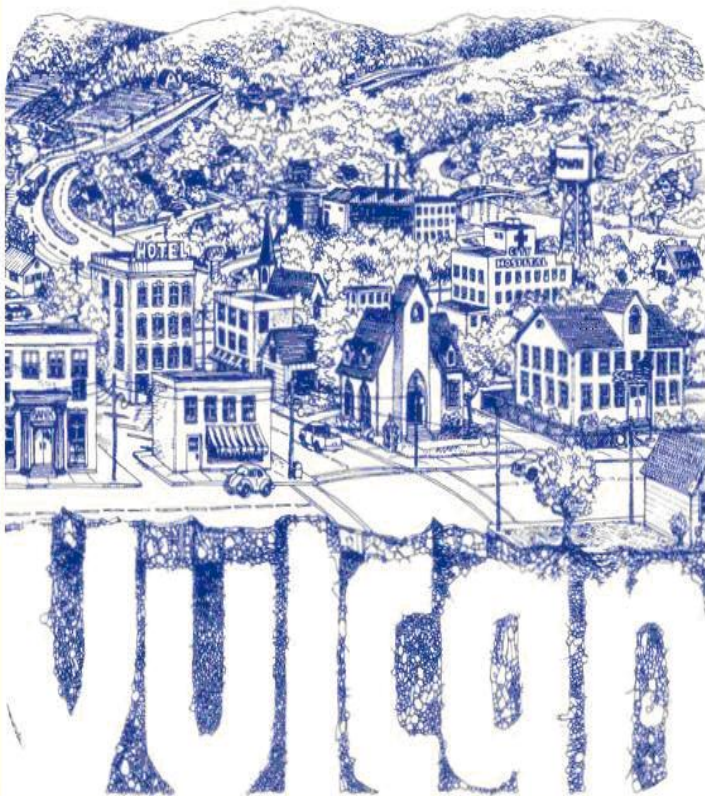
However, more recently, California has placed risk levels into statutes, namely Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986), which set levels for known human carcinogen and teratogen (reproductive toxicity) exposure (see <http://www.oehha.org/prop65.html>). He believes that California set this requirement at 1:100,000 or 1.0×10^{-5} risk (see <http://www.oehha.org/prop65/background/p65plain.html>); this is a higher risk requirement than the standard set by the U.S. EPA.

Other information on this subject may be found at the following links:

Risk assessment:
En.Wikipedia.org/wiki/risk_assessment

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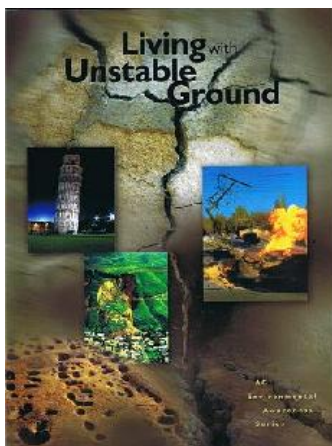
For more information, go to http://aegweb.org/files/public/NC_SEC_Geophysics_Workshop_brochure2.pdf

AGI BOOK "LIVING WITH UNSTABLE GROUND"

The recently published AGI book, "Living with Unstable Ground" is available here in the AEG Carolinas Section. Thanks to the support of our section sponsors, AEG Carolinas has a number of copies of the AGI book, Living with Unstable Ground available for members and non-members for a reduced price. This is a great book for non-geologists, and is intended to inform and elucidate planners, realtors, developers, builders, homeowners, and others on the potential dangers of unstable ground.

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Produced by the American Geological Institute in cooperation with Association of Environmental & Engineering Geologists, Applied Technology Council with support from the ATC Endowment Fund, and the U.S. Geological Survey. Paperback, 8.50"x11.00" 64 pp. For more information, or to purchase one of these books from our AEG Carolinas Section, please contact Paul Weaver, Section Chair, at pweaver@kleinfelder.com. The AGI Books will also be for sale at section meetings.



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EDUCATION SECTION

2010 JAHNS LECTURER PAUL MARINOS' VISIT TO THE CAROLINAS (AND OTHER STATES)

By Rick Kolb, Mactec

The 2010 Jahns Lecturer, Paul Marinos, visited the Carolinas in February. Rick Kolb arranged Paul's February schedule, and his visits to the East ranged from Florida International University in Miami to a meeting of the New York/Pennsylvania Section in New Jersey. There was another presentation scheduled for Rutgers University, which was unfortunately cancelled due to snow.

Paul presented to enthusiastic audiences at Virginia Tech, Radford University, Appalachian State University, East Tennessee State University, The College of Charleston, University of South Carolina, Furman University and UNC-Charlotte.

Section member Raymond Knox arranged Paul's visit to USC and wrote of his visit: *We had a great visit yesterday. More than 40 students attended. Presentation #21 in three weeks for Paul. I only regret that the sched-*

ule did not allow us to take Dr. Marinos across the Lake Murray Dam (the largest earth-filled dam in the world at the time it was finished and for many years after). Dinner last night included the Chair of the USC geology department and two professors. USC was insistent that we make the Jahns lecture an annual event on their seminar schedule.

Paul's schedule did not allow for a presentation at a section meeting in February (recall AEG President Duane Kreuger was our speaker in Concord). However, Paul has offered to visit us in September, so we might yet have him as our guest. And we plan to invite the 2011 Jahns Lecturer to the Carolinas.

The lecturer will be announced at the annual meeting in Charleston. For more information about the 2010 meeting, go to the AEG webpage at www.aegweb.org.

Rick Kolb of Mactec is the Past Section Chair of AEG Carolinas. He may be reached for comments or if you would like to volunteer to shepherd the next Jahns Lecturer at rkolb0915@aol.com.



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EDUCATION SECTION

RETURN TO YOUR ALMA MATER AS A VISITING PROFESSIONAL

By Rick Kolb, Mactec

As many of you know, section members have been making presentations on careers in geology through AEG's Visiting Professional program. Since we began our visits in 2006, section members have presented at the University of North Carolina at Chapel Hill (three times); at UNC-Charlotte and UNC-at Wilmington; at NC State University (three times); at Appalachian State University; and at the College of Charleston. Before the spring semester ends, we plan to present at Western Carolina University, the College of Charleston, Guilford College, Furman University and Wake Technical Community College. As news of our VP presentations spread, we've been invited outside the Carolinas and have presented at East Tennessee State University and will present this spring at Virginia Tech and Radford University.

Are you an alumnus of a college or university in North or South Carolina, Virginia or Tennessee? Would you be interested in going back to campus as a practicing professional and talking to the geology majors there? Typically we arrange for groups of three to five professionals from both the public and private sectors to visit a college. Each person talks for 15 to 20 minutes about their geology careers, how they got where they were, and provides career advice for students. Everyone has a good time. Send an email to Rick Kolb at rkolb0915@aol.com if you are interested in participating. We welcome new presenters to our group.

JOB OPPORTUNITIES

ZEBRA Environmental – a leader in Direct Push, Direct Sensing and Drilling Technologies is seeking a Branch Manager for our Mid-Atlantic office currently located in Raleigh, NC. Strong communication skills, industry experience and business development skills are required. The position will include the management of direct push, direct-sensing & drilling field crews and further expansion of our client base.

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(Continued on page 24)



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ANNOUNCEMENTS

February 2010 AEG Announcements:

1. 2010 Shelmon Specialty Conference. The dates are set for May 13 through May 15, 2010. Location will be Galveston, Texas. [Click Here](#) for registration forms, abstract information and venue information.
2. California Licensure update. [Click Here](#) for a summary of recent developments. Ground is being lost in the battle to preserve the Board, and your help is still needed!
3. 2010 Annual Meeting in Charleston, South Carolina; September 20-25. The registration forms and abstract submittal information is now available. (see page 7) Also, the deadline for submittal of abstracts is April 1st, 2010. [Click Here](#) for details of Technical Sessions, Symposia, Field Trips, Short Courses and Social Events.
4. Don't forget to renew your Membership for 2010 if you haven't already done so. [Click Here](#) to renew online.
5. E-publishing update. The Journal of Environmental & Engineering Geoscience to be available to Members electronically soon. Look for more details in the com-

ing months. Also, the Editors of the Journal want your technical papers and peer-reviewed articles for publication! Please contact [Abdul Shakoor](#) if you need more information..

6. Student Members. The Student and Young Professional Support Committee has developed numerous programs to help you with everything from starting a student chapter, the Visiting Professionals Program and writing your resume – just visit AEG's website and navigate through the Students tab. You can follow the Committee on Facebook at New Geologist. Also, if you are an AEG Student Member who recently graduated or is about to graduate, you are eligible to receive Full Member benefits FREE for one year after graduation. [Click Here](#) or contact AEG HQ for more details.
7. AEG AWARDS. As you saw in the January edition of the AEG NEWS, nominations for most of our Association Awards are due soon. A brief summary of the Award deadlines is included below;
 - Honorary Member 3/15/10
 - Floyd T. Johnston Service 4/15/10
 - Piteau Outstanding Young Member 4/15/10
 - Terzaghi Outstanding Mentor 03/31/10

(Continued on page 24)

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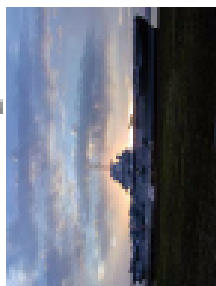
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AEG 2010 Charleston

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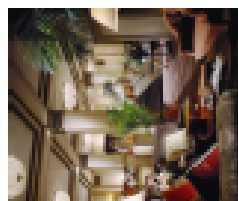
ASSOCIATION OF
ENVIRONMENTAL & ENGINEERING
GEOLOGISTS53rd ANNUAL MEETINGCharleston, South Carolina
Francis Marion Hotel
September 20 – 25, 2010For more information:
www.aegweb.orgSpecial Event
An Evening on the USS Yorktown

Our special event will feature a tour of the USS Yorktown and the Congressional Medal of Honor Museum, and dinner/entertainment on board the ship. The World War II aircraft carrier YORKTOWN is all 888 feet of her, is the flagship of the fleet at Patriots Point Naval & Maritime Museum. Patriots Point houses 25 aircraft ranging from the fighters and bombers of WWII up to a modern F-14 Tomcat. Talk about hands-on history! Sit in the cockpit of an F-4 Phantom, the first model used by the fabled Navy Blue Angels. Plus, stay in and hold tight inside our Navy Flight Simulator. Then, board the bridge of the carrier with its commanding view of Charleston Harbor and take the actual wheel of this massive, floating city of steel. Just what it was like for the more than 3,000 sailors who lived, fought, and sometimes died in epic Pacific battles. Are you a Japanese kamikaze? Turned into YORKTOWN. Overnight, young boys became fighting men and fighting men, in moments of greatness, became national heroes. Their stories are told in the Congressional Medal of Honor Museum aboard YORKTOWN. Visit www.patrimonypoint.org

Guest Tours

- Charleston Tea Plantation and Strolling on Edisto
- Beach
- Dine! (Re Charleston)
- Gullah Tour
- Cypress Gardens

Meeting Hotel



The Francis Marion Hotel, located in the heart of historic Charleston, South Carolina, was the largest and grandest in the Carolina when it opened in 1924. Named for General Francis Marion, the "Swamp Fox" of the American Revolution, the Francis Marion Hotel in Charleston re-opened in 1996 after a \$12 million "National Trust" award-winning renovation, and is once again Charleston's Grand Hotel.

For more information visit www.francismarioncharleston.com

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Technical Program and Symposia

Paul Weaver, weaver@edison.cofc.edu

Meetings Manager, Exhibitors & Registration

Colorado Event Organizers, Inc. (CEO)

Heather Skidmore, mskiding@uapgs.org

About Charleston ...

With a rich, 300-year history, Charleston today is America's most beautiful and historically preserved architectural and historical treasure. The city's past is a testament to the spirit and tenacity of its citizens. Its appeal has been described as a "living museum." As Charleston native Elizabeth O'Neill Varner once said, "It is impossible for me to enter Charleston from any side, whether by land or by sea, and not feel that here the land is precious; here is a place worth keeping." Visit www.charlestonc.com to check out all that the area has to offer.

**Join us for a week of education,
networking, and fun in Charleston!**

Field IDs

- *From the Atlantic to Appalachians and Back:*
Overnight trip between the North Carolina mountains and Charleston. Includes stops at a landfill in NC, pumped storage project in Western SC, a scientifically re-created dam site in Central SC, and other stops.
- *Environmental Remediation and History of the Savannah River Site:*
One-day trip to nuclear plant to see environmental remediation and other plant technologies at work.
- *Coastal Protection on Kiawah and Seabrook Islands, South Carolina*
One-day trip to local barrier islands.
- *Charleston Earthquake Walking Tour:* 3-4 hours, may run several during meeting at both field trips and guest tours. Shown and discussed evidence of 1886 magnitude 7 Charleston Earthquake on structures in downtown Charleston.
- *Macroeffects of the 1886 Charleston Earthquake:*
One-day trip. Will explore evidence and effects of 1886 Charleston earthquake and paleo-earthquake throughout the Charleston region, including structural damage, 1886 and paleo-liquefaction evidence, and other earthquake-induced events.

Short Courses

- **FEMURAZUS Course**
- **Introduction to Groundwater Chemistry**
- **Book Core Descriptions**
- **Use Of Geophysical Equipment**
- **Intermittent Groundwater Chemistry**
- **Practical Rock Slope Engineering**

Technical Program

In conjunction with the meeting theme, the technical program (September 22-24, 2010) will focus on:

COASTAL ASSURES	
Synopsis Carolina Bays	
Coastal Engineering and Environmental Geology	
Coastal Protection Program	
Coastal Erosion and Sedimentation and Control	
CHESAPEAKE JAMES RIVER COMPLEX	
Synopsis Discussion of the historic quays	
Synopsis Update of Charleston Seismic Source (NRC)	
Synopsis Effects of earthquake on other S.C. water (H&JUS)	
Synopsis Engineering Mapping in South Carolina	
CHESAPEAKE GEOTECHNICAL & CIVIL ENGINEERING ASSOCIATION	
Synopsis Kowale Bridge Engineering Geology	
Synopsis Formulation of Charleston Aquatic Site	
COLUMBIA RIVER	
Synopsis Geophysical Application in Engineering Geology	
Synopsis Geophysical Application in Environmental Geology	
COLUMBIA RIVER SEISMICITY	
Synopsis Landslide Causes, Effects, and Case Histories	
Slip Stabilization Methods	
SEISMIC HAZARDS	
Synopsis Formulate Identification and New Market Quake	
Synopsis State Geological Survey Addressing of Seismic Hazard	
Paleoseismology and Faulting	
GENERAL GEOLOGICAL HAZARDS	
Synopsis State/Private Sector Hazard Issues and Planning	
Synopsis Coal Slurry Impoundment Failure at TVA's Kingston, Tennessee, Coal Plant	
How many Geological Surveys are addressing globalized	
Synopsis Seismicity and Planning Due to Groundwater Withdrawal	
GROUNDWATER HYDROGEOLOGY	
Synopsis Groundwater Supply in the Coastal Plain of the Southeastern US	
Synopsis Contaminant Hydrogeology of Fractured Rock Aquifers	
General Hydrogeology	
Environmental Contaminant Geology and Remediation	
Groundwater Chemistry	
Groundwater Resource Characterization and Conjunctive Use	
Waterflood Remediation	
Methods Identification and Remediation Methodology	
PROCEEDINGS OF THE 1994 CONFERENCE ON GROUNDWATER	
USE OF GWT	
Synopsis License and Accreditation Issues in the Professional Practice of Geology	
Synopsis History of Engineering Geology	
Synopsis Future of Engineering Geology	
Synopsis Update from the Annual Days of Geologic Field Work	
Synopsis Carbon Sequestration	

Synopsis/Where: Geology and Geotechnical Engineering Meet
Synopsis/Military: Geology
Synopsis/Highway: Construction and Maintenance
Industrial Minerals/Geology
Trends in Energy Development: Oil Shale, "Clean" Coal, Geothermal, Etc.
Teaching
Remote Sensing/GIS
Site Characterization
Chemical Environmental and Engineering Geology Case Histories
Soil Characterization and Interpretive Skills
Construction Materials Investigations
Geologic Studies for Levees
Synopsis/Computer Applications for Geologic Investigation and Reporting
Synopsis/GIS Applications for Geologic Investigation and Reporting
Synopsis/Geo-visualization Techniques for Geologic Investigation
Geologic Studies for Transportation
Fluvial Geomorphology
Geologic Field Investigation Methodology
Geologic Field Mapping
Geologic and Archeological Investigations
Synopsis/Rockfall Prevention
Synopsis/Rock Mass Characterization and Rock Mechanics
PHOTOGRAMMETRIC APPLICATIONS IN ENVIRONMENTAL GEOLOGY
Synopsis/Environmental Site Characterization and Remediation
Synopsis/Remediating Biogeochemistry Issues in Environmental Geology
Landfills
Water Reclamation
Naturally Occurring Environmental Hazards and Their Remediation
Underground Injection Case Histories
REUSE
Synopsis/Engineering Geology in the Maintenance and Remediation of Existing Dams*
Synopsis/Geologic Investigation and Oversight During Construction of the Sabula Dam
Synopsis/Post-Construction Studies of Dam Failure

Online Abstract Submittal is now available at
www.segweb.org. Abstract Deadline is April 15, 2010

(Continued from page 21)

- Holdredge Publication 4/15/10
 - Outstanding Section 5/1/10 (based on annual report)
 - Outstanding student chapter 6/15/10 (based on annual report)
 - Student Professional Paper 5/1/10
 - Outstanding Reviewer of E&EG 5/1/10
 - AEG Publication 5/1/10
 - Schuster Award 3/31/10 – (Nominations are now being accepted)
 - Jahns Lecturer 3/21/10
- [Click Here](#) for more information.

8. American Geological Institute (AGI) Congressional Visit Days (CVDs) are scheduled for April 28 & 29 and September 15 & 16, 2010. AEG encourages Members and other Geoscience professionals to attend one of the scheduled CVDs and talk to our elected officials about the importance of engineering geology. [Click Here](#) for more information.

(Continued from page 20)

professional will be required to assist with field work and report preparation for various environmental investigations, compliance monitoring, and hydrogeologic investigations. Position involves environmental sampling and other field work, as well as regulatory reporting, and requires travel. A B.S. in Geology, Environmental Science, or similar earth science, along with OSHA 4-hour certification is preferred but not required.

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CALENDAR OF EVENTS - 2010

Geological Events in the Carolinas

Courtesy of AEG Carolinas Section – www.aegcarolinas.org. Last updated March 17, 2010

Send updates/corrections to Rick Kolb, MACTEC, rkolb0915@aol.com.

Meeting Date, Time, and Location are Subject to Change – Please Verify Prior to the Meeting

Date: Tuesday, March 23, 2010

Event: AEG Visiting Professionals Presentation
Location: 5:30 PM in the Frank Family Science Center;
Guilford College, Greensboro
Contact: Paul Weaver, pweaver@kleinfelder.com

Date: Thursday, March 25, 2010

Event: AEG Visiting Professionals Presentation
Location: 3:30-5:00 in McEniry Hall; University of
North Carolina at Charlotte
Contact: Rick Kolb, rkolb0915@aol.com

Date: Thursday, March 25, 2010

Event: AEG Visiting Professionals Presentation
Location: 5:30 PM in Room 105; Plyler Hall; Furman
University; Greenville, South Carolina
Contact: Jenn Bauer; jennbbauer@gmail.com

Date: Tuesday, April 6, 2010

Event: AEG Visiting Professionals Presentation
Location: 12:00-1:00 PM, Geology Lab, Room 210, Li-
brary Education Building; Wake Technical Commu-
nity College; Raleigh
Contact: Rick Kolb, rkolb0915@aol.com

Date: Tuesday, April 6, 2010 (meetings are held
monthly on the first Tuesday of the month)
Event: Engineers Without Borders monthly meeting,
Research Triangle Park Professional Chapter
Location: 6:30-8:30 PM at the offices of Camp Dresser &
McKee; 5400 Glenwood Avenue; Raleigh
Contact: Bill Buckner, Chapter President, wbuckner@nc.rr.com

Date: Thursday, April 8, 2010

Event: AEG Carolinas Section Spring Meeting
Speakers: Bill Buckner and Dave Miller, Engineers
Without Borders, RTP Chapter; Bonnie Ware,
NCDENR, Inactive Hazardous Sites Branch (see
detailed announcement elsewhere in this newsletter)
Location: 6:00-9:00 PM; Fox & Hound; North Hills
Mall, Raleigh, North Carolina
Contact: Rick Kolb, rkolb0915@aol.com
Est. PDH: 1

Date: Thursday, April 8, 2010

Event: AEG Visiting Professionals Presentation
Location: 5:00-6:30 PM; Stillwell Building; Western
Carolina University; Cullowhee, North Carolina
Contact: Rick Kolb, rkolb0915@aol.com

Date: April 11-15, 2010

Event: 2010 NGWA Ground Water Summit and 2010
Ground Water Protection Council Spring Meeting
Location: Denver, Colorado
Contact: National Ground Water Association;
www.ngwa.org; (800) 551-7379

Date: April 12-16, 2010

Event: The Remediation Course
Location: Las Vegas, Nevada
Contact: Princeton Groundwater, Inc.; www.princeton-groundwater.com; (813) 964-0800

Date: April 14-16, 2010

Event: A Conference on Sustainable Property Transac-
tions: Retooling the Business of Contaminated Site
Redevelopments
Location: Sheraton Society Hill Hotel; Philadelphia,
Pennsylvania
Contact: RTM Communications; www.rtmcomm.com;
(800) 9NO-RISK

Date: April 15, 2010

Event: Aquifer Test Analysis in Fractured Rock with
Emphasis on Nonstandard Approaches and Interpre-
tations (short course #195)
Location: Denver, Colorado
Contact: National Ground Water Association;
www.ngwa.org; (800) 551-7379

Date: April 15, 2010

Event: Introduction to Phytoremediation and Plant/
Groundwater Interactions (short course #136)
Location: Denver, Colorado
Contact: National Ground Water Association;
www.ngwa.org; (800) 551-7379

Date: Thursday, April 15, 2010 (meetings are held
monthly on the third Thursday of the month)

Event: South Carolina Association of Environmental
Professionals monthly meeting
Location: 6:30 PM at Edens and Avant, 1221 Main
Street; Columbia, North Carolina
Contact: Deborah Langley, deborah.langley@pacelabs.com
Est. PDH: Unknown

(Continued on page 27)

Date: Friday, April 16, 2010

Event: AEG Visiting Professionals Presentation
 Location: 3:00 PM in Room 221 of the New Science Center; The College of Charleston
 Contact: Briget Doyle, doyleb@cofc.edu

Date: April 20-23, 2010

Event: The Environmental Sampling Field Course
 Location: Las Cruces, New Mexico
 Contact: The Nielsen Environmental Field School; www.nielsenenvironmentalfieldschool.com

Date: April 22, 2010 (meetings are held quarterly at Upton Associates)

Event: Meeting of the North Carolina Board for the Licensing of Geologists
 Location: 9:00 at Upton Associates; 3733 Benson Drive; Raleigh, North Carolina
 Contact: Barbara Geiger, ncbgl@bellsouth.net; (919) 850-9669

Date: April 28-29, 2010

Event: Science-Engineering-Technology Congressional Visit Days
 Location: 12:00 noon at the AAAS Auditorium; Washington, D.C.
 Contact: <http://www.setc vd.org>

Date: Wednesday, May 5, 2010

Event: Advanced Technologies for Contaminated Site Remediation and Gas Vapor Intrusion Management: Methods, Applications and Strategies
 Location: 8:30 AM-12:30 PM; Marriott City Center; Raleigh, North Carolina (includes breakfast)
 Contact: Regenesis Seminar Coordinator at (949) 366-8000

Date: Wednesday, May 13—Friday, May 15, 2010

Event: Schlemmon Specialty Conference; Modern Subsidence, Sea-Level Rise, and the Future of the Gulf Coast.
 Location: Galveston, TX
 Contact: <http://aegweb.org/i4a/pages/index.cfm?pageid=3694> for registration forms, abstract information, and venue information.

Date: Thursday, June 17, 2010

Event: Joint Meeting of AEG Carolinas Section and Ground Water Professionals of North Carolina
 Location: 6:00 PM at the Little River Golf and Resort; Carthage, North Carolina
 Speaker: Dr. Stan Riggs, East Carolina University
 Topic: From Fossil Fuels to the Oceans: A Plethora of Solar Energy
 Contact: Nichole Manning; nichole@choice-enviro.com
 Est. PDH: Unknown

Date: Friday, June 18, 2010

Event: 11th Annual Golf Tournament of the Ground Water Professionals of North Carolina
 Location: Little River Golf and Resort; Carthage, North Carolina
 Contact: Guy Veni; guyv@aedi.biz

Date: Friday, August 20, 2010 (tentative)

Event: Joint Meeting of the AEG Carolinas Section and the Western Branch, North Carolina Section of the American Society of Civil Engineers
 Speaker: Shane Clark, North Carolina Geological Survey; Asheville, North Carolina
 Topic: I-40 Rockslide of October 2009
 Location: 6:00-9:00 PM; Asiana Grand Buffet; 1968 Hendersonville Road; Asheville, North Carolina
 Contact: Kristen Lloyd, khlloyd@mactec.com
 Est. PDH: 1

Date: September 21-22, 2010

Event: AGI's Geoscience Congressional Visit Days
 Location: Starting at 12:00n at AGU Headquarters; Washington, D.C.
 Contact: <http://www.agiweb.org/gap/events/geocvd09/index.html>.

Date: September 17-19, 2010

Event: Carolina Geological Society Annual Meeting and Field Trip
 Location: Charleston, South Carolina
 Contact: Details available in June at www.carolinageologicalsociety.org

Date: September 20-25, 2010

Event: AEG Annual Meeting
 Location: Francis Marion Hotel; Charleston, South Carolina
 Contact: Briget Doyle; doyleb@cofc.edu
 Est. PDH: not yet established

Date: September 19-24, 2011

Event: AEG Annual Meeting
 Location: Anchorage Hilton Hotel; Anchorage, Alaska
 Date: November 4-7, 2012
 Event: Geological Society of America Annual Meeting
 Location: Charlotte, North Carolina

Congressional Visits Need Citizen Geoscientists



Please come to Washington DC in April and/or September, 2010 for organized group visits with policymakers in the U.S. Congress.

Decision makers need to hear from geoscientists. Become a citizen geoscientist and join many of your colleagues for a workshop at AGU headquarters followed by a day conducting visits with Members of Congress or congressional staff on Capitol Hill.



The visits will focus on the importance of geoscience research and development and geoscience education. Geoscientists will speak for these shared concerns with a unified message and can enhance the message by using examples from their professional work and experiences.



**Science-Engineering-Technology
Congressional Visits Day**
April 28-29, 2010



**Geosciences Congressional Visits
Day**
September 21-22, 2010



AGU and the American Geological Institute (AGI) support Congressional Visits Days in partnership with many other science and engineering societies.

For more information or to sign up, please contact:

Elizabeth Landau, AGU Public Affairs, elandau@agu.org

Linda Rowan, AGI Government Affairs, rowan@agiweb.org



MEMBER BENEFITS

Networking, with colleagues at meetings, through technical publications and on the AEG web page, is a valuable professional development benefit because it allows a member to:

- ♦ Broaden and update technical, practical, and business knowledge.
- ♦ Keep career paths open by assuring that the value, utility and scope of engineering geology is recognized in the scientific, technical, legal, and regulatory arenas.
- ♦ Explore numerous opportunities for career enhancement through contacts at technical meetings and in continuing education programs.
- ♦ Influence the profession of environmental and engineering geology as it serves society and as it is regulated.
- ♦ Establish the standards of the profession.

AEG members receive our quarterly professional journal, *Environmental and Engineering Geoscience* and six issues of the *AEG NEWS* as a regular dues benefit.

Members also enjoy a 20% "member discount" on all special publications, registration fees at meetings, short courses, and field trips.

PROFESSIONAL DEVELOPMENT

*AEG -- Serving Professionals in
Environmental, Ground-Water and
Engineering Geology since 1957*

- ♦ AEG sponsors workshops and short courses for which official Continuing Education Units are offered.
- ♦ AEG encourages its members to participate in activities of mutual interest with other societies and organizations.
- ♦ The annual Richard H. Jahns Distinguished Lecturer in Engineering Geology is co-sponsored by AEG and the GSA Engineering Geology Division.
- ♦ AEG members make presentations and lead field trips for students at all levels.
- ♦ AEG's Technical and Professional Practice Committees keep the Association in a position of influence through their wide-ranging activities.
- ♦ AEG's 25 Sections and 20 Student Chapters provide educational and networking opportunities for members through regular meetings, field trips and local newsletters.
- ♦ Students compete for scholarships and awards, and interact with practicing professionals.
- ♦ Short courses, field trips, and technical sessions provide opportunities for AEG members to enhance their professional practice.
- ♦ International members are found in more than 20 countries and Designated Correspondents enhance technology transfer among more than a dozen countries.

MEMBERSHIP APPLICATION

**ASSOCIATION OF
ENVIRONMENTAL &
ENGINEERING GEOLOGISTS**



The Association of Environmental & Engineering Geologists (AEG) is an international, non-profit scientific and technical society, whose 3,000 members include geologists specializing in engineering geology, environmental geology, and ground-water geology as well as other professionals in affiliated fields such as civil and mining engineering, land-use planning, public policy and education.

Through its technical and professional activities, AEG strives to promote the value and importance of geologic practice in:

- ♦ detecting, containing, and remediating contaminated soil and ground water;
- ♦ recognizing and mitigating hazardous geologic processes to promote public safety and welfare; and
- ♦ siting, planning, designing, constructing, and maintaining engineered works.

Check Us Out
www.aegweb.org

MEMBERSHIP REQUIREMENTS

MEMBER: Applicants for Member Class shall hold a degree in geology, engineering geology or geological engineering, or a degree in a related professional field with 30 semester-hours of credit in the geosciences. In addition an applicant shall be practicing in the field of Engineering Geology, Environmental Geology or Hydrogeology. Annual Dues for new (first-time) Members = \$75.00 per year for the first year of membership. Otherwise Annual Dues = \$115.00. Applicants who qualify for Member Class, but are engaged in full-time teaching at the Primary or Secondary (K-12) level are eligible for Teacher Status (Annual Dues = \$35.00).

AFFILIATE: Applicants for Affiliate Member Class shall be scientists or engineers who work with engineering geologists; teachers engaged in middle-school and high school Earth Science education; or persons interested in engineering geology. Annual Dues = \$75.00 (Teacher Dues = \$35.00)

STUDENT: Applicants for Student Member Class shall be full-time students enrolled in an academic program in the geosciences or in a related field in engineering. Annual Dues = \$25.00

INTERNATIONAL: Applicants shall hold the same requirements as for Member Class, but may select from the following dues schedule: \$35, which includes the *Environmental and Engineering Geology Journal*; \$45 with the *Journal*, the *Annual Directory* and the *Annual Meeting Abstracts*; or \$55 with the *Journal*, *Annual Directory*, *Annual Meeting Abstracts* and the *AEG News*.

AEG memberships are based on calendar year. Applications received after October 1 will be entered for following calendar year.

APPLICATION FORM

Please complete this form and mail it with your Annual Dues payment to the Association's Headquarters office for processing. New member applicants do not pay Section dues for their initial year of membership.

Name: _____
(Please print your name as you would like it shown on your membership certificate.)

PREFERRED ADDRESS: _____

WORK PHONE: _____ FAX: _____

PREFERRED E-MAIL: _____

Second Address: _____

Home Phone: _____

DESIRED CLASS OF MEMBERSHIP: _____ ANNUAL DUES AMOUNT: _____

CERTIFICATION: _____
(Signature)

My signature attests that, to the best of my knowledge, I meet the academic and practice requirements for the membership class I have requested and that all entries on this application are true and correct. I also authorize AEG to charge my credit card for the dues payment, if I selected the credit card payment option.

☐ Enclosed is my check for the amount of Annual Dues of \$ _____

Credit Card Payment Option

☐ Discover ☐ MasterCard ☐ Visa Amount of Dues to be charged to my card = \$ _____

Card Number: _____ Expiration Date: _____

SUBMISSION: Send this form with your check or credit card authorization to:
Association of Environmental & Engineering Geologists, PO Box 460518, Denver, CO 80246
Phone: 303-757-2926 FAX: 303-757-2969 AEG Web: www.aegweb.org



AEG CAROLINAS SECTION – SPONSOR INFORMATION

The Carolinas Section of AEG supports many of its activities with financial assistance provided by our sponsors. Our activities include quarterly meetings, periodic field trips and seminars, a quarterly newsletter, and email announcements about our meetings and geoscience related activities. In addition, we donate educational resources to science teachers.

We offer several levels of sponsorship, but they all have one goal: to keep the sponsor's name in front of our members and to bring you business. We have a real commitment to connecting our sponsors to potential buyers and will do all we can to help you build your business. Most of our members are practicing professionals with responsibility for selecting subcontractors, so our group is a great place to find new customers and to catch up with existing customers in an informal setting.

Our sponsors provide financial support that allows us to have reasonably priced dinner meetings, host seminars, provide discounted dinner meeting costs for students, underwrite the cost of newsletters and our web site, support science education tools to our teachers and in our schools, and provide funding for two \$500 scholarships each year. All costs listed below are per year and end in December. New sponsorships received after October will continue to December of the following year.

Silver Sponsor (\$250):

GeoNews Newsletter: Business card size ad (2" high x 3-1/2" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign-in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibits: Space for tabletop display at one meeting. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, www.aegcarolinas.org, with a link to your site.

Gold Sponsor (\$375):

GeoNews Newsletter: Quarter-Page ad (4-1/2" high x 3-1/2" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibits: Space for tabletop display at two meetings. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, www.aegcarolinas.org, with a link to your site.

Platinum Sponsor (\$500):

GeoNews Newsletter: Half-page ad (4-1/2" high x 7" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibit: Space for tabletop display at three meetings. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG - Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, www.aegcarolinas.org, with a link to your site.

GeoNews Newsletter Sponsorship Only

Businesses or individuals can also advertise in GeoNews without being a full sponsor. The annual rates for advertising in GeoNews are as follows:

Business Card	\$ 40.00
Quarter Page	\$ 60.00
Half Page	\$ 100.00
Full Page	\$ 200.00

Please complete the form below and mail to Jane Gill-Shaler, AEG Carolinas newsletter editor. Please call or email if you have any questions (contact information below).

AEG Carolinas Section Sponsorship Form

Please begin our sponsorship of the Carolinas Section of the Association of Engineering Geologists. Our sponsorship level is:

- _____ Platinum Section Sponsorship, \$500/year
 _____ Gold Section Sponsorship, \$375/year
 _____ Silver Section Sponsorship, \$250/year
 _____ GeoNews Newsletter Sponsor Only (see above)

Name: _____

Address: _____

City, State, Zip: _____

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Contact Person: _____

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Something about your company _____

Please enclose a business card or email ad in jpg, pdf, or doc To Jane Gill-Shaler at janehgill@aol.com.

MAKE CHECK OUT TO AEG CAROLINAS

Snail mail form and payment to:

Jane Gill-Shaler, AEG Carolinas Newsletter Editor
 1636 West Lexington Ave., High Point, NC 27262
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Thank You, AEG Carolinas Sponsors!!

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Pine Environmental, Inc., Paul Federline, 866-646-7463, pfederline@pine-environmental.com. Pine is the leading provider of rental equipment in the nation with the latest instruments available. Pine Environmental Services, Inc. takes pride in their unprecedented customer support and competitive pricing. Extended hours of operation and after-hour emergency support are on hand.

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Zebra Environmental, Inc., Mike Early, 919-424-6122, MikeE@zebraenv.com, www.teamzebra.com. ZEBRA is a specialized environmental contracting company dedicated to providing high quality subsurface sampling, installation, injection and data collection services to engineering and consulting firms. Since 1992, ZEBRA has earned a solid reputation as the most experienced, best equipped and most reliable direct push/probing service provider on the East Coast.

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LandProbe, LLC, Joy Stugg, 888-349-0176, joy@landprobe.com, <http://www.landprobe.com>. We are a full service environmental and geotechnical drilling contractor with locations in Greenville, SC, Monroe, GA, and Asheville, NC, – serving clients throughout the southeastern United States.

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Thank You, AEG Carolinas Sponsors!!

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ChemRem International. Travis Bowman (704) 728 5800, tbowman@chemrem.com. Jim Studer, (505) 858 3136, jstuder@chemrem.com. www.chemrem.com. ChemRem provides manufacturer representation service to the environmental remediation and restoration marketplace. ChemRem's focus is on products for chemical oxidation and bioremediation of organic contaminants present in soil, rock, groundwater, surface water, and wastewaters.

ENCO Laboratories, Inc. Jim Hays, 919-467-3090, jhays@encolabs.com, <http://www.encolabs.com>. A network of environmental laboratories that has been providing analytical testing services since 1988.

Environmental Products and Services of Vermont, Inc. Peter Marotta, 919-852-3595, pmarotta@epsofvermont.com, www.epsofvermont.com. EP&S is a comprehensive environmental and industrial contractor providing a wide range of services from Emergency Spill Response, Vacuum Truck Services, Soft Utility Excavations, Tank Removal and Cleaning, Industrial Cleaning and Maintenance Services, Site Remediation, Hazardous and Non-Hazardous Waste Disposal and more.

ESC Lab Sciences. Barry C. Kroll, 1-(800) 767-5859, bkroll@esclabsciences.com, www.esclabsciences.com. ESC Lab Sciences is a nationally accredited environmental laboratory certified for the analysis of soil, water, and air by numerous certifying agencies.

Garco, Inc. Al King, 336-683-0911, alk@egarco.com, <http://www.egarco.com>. GARCO, Inc. provides environmental, industrial, waste transportation, disposal and recycling services to industrial and consulting clientele throughout the Southeast.

Geotech Environmental Equipment, Inc. David Hathaway, 919-460-0604, 919-460-0984, davidh@geotechenv.com, <http://www.geotechenv.com>. Geotech manufactures and distributes sampling, filtration, analytical and remediation products for the ground and surface water industry.

Joyce Engineering, Inc., Greensboro Office. Hannu Kemppinen, 336-323-0092, hkemp-pin@joyceengineering.com, www.joyceengineering.com. Joyce Engineering is a full-service solid waste management consulting firm dedicated solely to the solid waste industry throughout the Mid-Atlantic and Southeastern United States.

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