Communicating Key Information & Concerns to Geologists and Environmental Professionals

Issue 4 / 2014



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Message from the President

Hello and Happy Holidays!

As my term as PCPG President draws to a close at the end of this year, I wanted to take this opportunity to extend my gratitude to our membership for allowing me to serve you in this capacity. It has truly been a



privilege, and writing this last President's Message for the newsletter gives me the opportunity to reflect on some of the highlights of the last two years. At our Annual Meeting in 2013, we celebrated 20 years of PG licensure in the Commonwealth of Pennsylvania, and in 2014 we celebrated the 25th Anniversary of PCPG, complete with a blizzard, in January for our Annual Meeting, and beautiful weather in May for our Gettysburg field trip and anniversary picnic. As our industry has changed over the last 25 years, PCPG has adapted to support the growth and success of our members, and as much as things change, our commitment to advocacy, education, and networking remains the same. We are very fortunate to have such an active membership, which is supported by a very talented and dedicated Board of Directors. Thank you for your ongoing support, and I look forward to seeing you at one of our upcoming events!

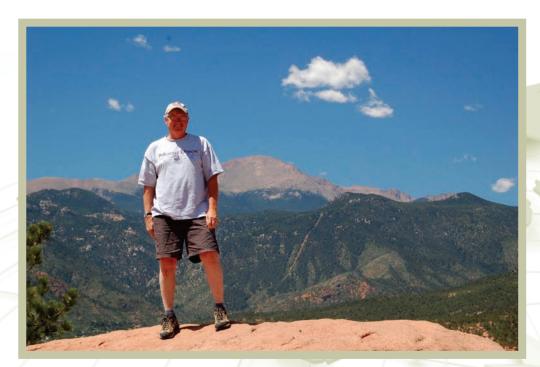
Please feel free to email your questions and comments to me at <u>ioreilly@gesonline.com</u>, and check out our website for more information at <u>www.pcpg.org</u>.

Very Truly Yours,

Jennifer L. O'Reilly, P.G.

PCPG President

PCPG BOARD OF DIRECTORS MEMBER BILL GOUGH, P.G., IS RETIRING





Long-time PCPG member

Bill Gough, P.G., has recently

announced his retirement from

professional practice.

Born and raised in Pittsburgh, Bill earned Bachelors and Masters degrees in Geology and Hydrogeology from Mount Union College and Penn State University, respectively, and joined Moody and Associates in 1973. A strong advocate for PCPG in western PA, Bill, as well as his employer Moody and Associates, has been a charter member of PCPG since its founding in 1989. Bill's contributions to PCPG have included no fewer than six terms on the Board of Directors, and, more recently, serving as Membership Services Committee Chair (2013, 2014). It is rumored that he never missed a Board meeting!

Over the last two years, Bill has played a major role in visualizing and implementing PCPG's college and universities outreach program, including development of PCPG's information brochure for students. Bill is an accomplished photographer, and over the years has kindly supplied

hundreds of photos for use in publications, newsletter and brochures, including (most recently) the 25th Anniversary PCPG Field Trip in Gettysburg. In his free time, Bill and his wife Merrideth are also world-travelers, and he is an avid fan of the Purple Raiders football team.

PCPG's Board would like to express our most sincere gratitude to you, Bill, for your many valuable years of service to this organization. It has been a pleasure to serve with you, and we wish you and Merrideth all the best in your future adventures!

Brenda Costa, P.G., (Moody and Associates) has been appointed to fill the one year remaining on Bill's Board term, which expires December 2015.



PCPG's Colleges Outreach, Fall 2014

As part of PCPG's continuing outreach efforts to geology departments in Pennsylvania and adjoining states, members of the Board traveled to two universities this Fall to spread PCPG's message to students and faculty.

EDINBORO UNIVERSITY, EDINBORO, PABill Gough, P.G.

Bill Gough, former PCPG Board Member, visited with students and faculty in the Department of Geosciences at Edinboro University of Pennsylvania, in Edinboro, PA, on September 30, 2014. Bill's visit was arranged and coordinated with Dr. Joe Reese, Professor of Geology. Approximately 30 students and faculty attended Bill's presentation. Bill explained the mission of PCPG and also PCPG's efforts to foster better communication between professional geologists and faculty and students at academic institutions, and informed the attendees about options for membership in PCPG. Bill outlined the requirements to become a Licensed Professional Geologist (PG) in Pennsylvania and also the process to

work toward a Geologist-in-Training (GIT) Certificate. Of particular interest and importance to faculty and students was a discussion of appropriate coursework required for admittance to the licensing exam, which includes a Fundamentals of Geology Exam (FG) and a PG Examination administered by the National Association of State Boards of Geology (ASBOG). In addition, copies of the brochure recently developed by PCPG for students and faculty were distributed. The link to reach the new PCPG brochure is: www.pcpg.org//GITbrochure.

The wide range of job opportunities for geologists was discussed as well as the available career pathways in the geosciences. Bill shared examples of the variety of geological projects he has worked on throughout his career at Moody and Associates, Inc. The $1\frac{1}{2}$ hour presentation was well received and Bill fielded numerous questions from the students and faculty.

INDIANA UNIVERSITY, INDIANA, PA

Martin F. Helmke, PhD, P.G., West Chester University of Pennsylvania

PCPG Board Members Mark loos and Martin Helmke met with students and faculty at the IUP Department of Geoscience on November 7, 2014 in response to an invitation by Dr. Karen Rose Cercone. IUP is one of the 14 universities of the Pennsylvania State System of Higher Education. Mark, who is an alumnus of the IUP geoscience program, delivered a 20-minute presentation during a brown-bag seminar to discuss career opportunities for geologists, PCPG's mission, curriculum recommendations, and how students can earn the GIT Certification and PG License. Students and faculty asked numerous questions related to licensing, ethics, and the job market. We are pleased to report that, like many geoscience programs nationally, the number of IUP students who major in geology has dramatically increased over the past several years. All of their students are actively engaged in research with faculty.

PCPG looks forward to continuing to work with Edinboro, IUP, and other geology programs across the Commonwealth. If your college or university geology department would like to request an informational visit from PCPG, please contact Barbara Dunst, P.G. at bdunst@eat.com.

PCPG's REVISED AND UPDATED SHALE GAS POSITION STATEMENT

In April 2010, PCPG's Marcellus Shale Committee (now the Shale Gas Committee) published its first "Marcellus Shale Position Statement". Recently, the committee re-assessed that position paper, as it was over four years old. For the most part, we thought it stood up fairly well, but decided to update portions of the statement. One seemingly minor but important update is the removal of "Marcellus" from the statement. The committee recognizes that the Marcellus Shale is not the only shale gas reservoir within the Commonwealth that is currently being developed. The oil and gas industry has advanced a number of technologies since the initial "Marcellus Shale Position Statement" and it was decided that key technologies should be addressed in the new statement. The updated statement also recommends areas for continued research.

PCPG's updated "Shale Gas Position Statement" is presented below, and has also been posted on PCPG's website <u>www.</u>
<u>pcpg.org</u>. PCPG strongly encourages members of the geologic community working in the shale gas industry to continue to utilize best practices and due diligence in their efforts.

PCPG SHALE GAS POSITION STATEMENT

The Pennsylvania Council of Professional Geologists (PCPG) is a diverse group of licensed Professional Geologists (PGs) and allied scientists who advocate the use of sound science in the: (a) formulation of public policy; (b) protection of human health and the environment; (c) establishment and evaluation of regulatory programs; and (d) the dissemination of accurate information. Early participation by Professional Geologists and allied scientists in evaluations and decisions involving natural resources facilitates sound scientific outcomes.

PCPG supports the responsible development of Pennsylvania's natural resources, including shale gas, and has prepared this statement to provide a balanced review and discussion of shale gas issues. This statement is also intended to dispel common misunderstandings, provide comments as to appropriate public and regulatory policy (from a technical and geologic perspective) and identify critical areas where additional information and study are needed. PCPG expects to periodically review and amend this statement as shale gas exploration and development procedures evolve, and as geologic and technologic advances continue to change the exploration and production landscape across the Commonwealth of Pennsylvania and the Appalachian Basin.

Current shale gas exploration within the Commonwealth of Pennsylvania is not limited to the Marcellus Shale. Shale gas is also being explored for and produced from other formations, including the Upper Devonian Rhinestreet, Middlesex and Geneseo/Burket Shales, the Ordovician Utica Shale and the Point Pleasant Member of the Utica Shale. Although the Marcellus Shale is currently the largest shale gas producer in the Commonwealth, the exploration of and production from the other shales will also continue across the state. In addition, other tight geologic formations are being considered for their potential to economically produce oil and natural gas, throughout the Commonwealth.

The elements of PCPG's position on Shale Gas Exploration and Production are as follows:

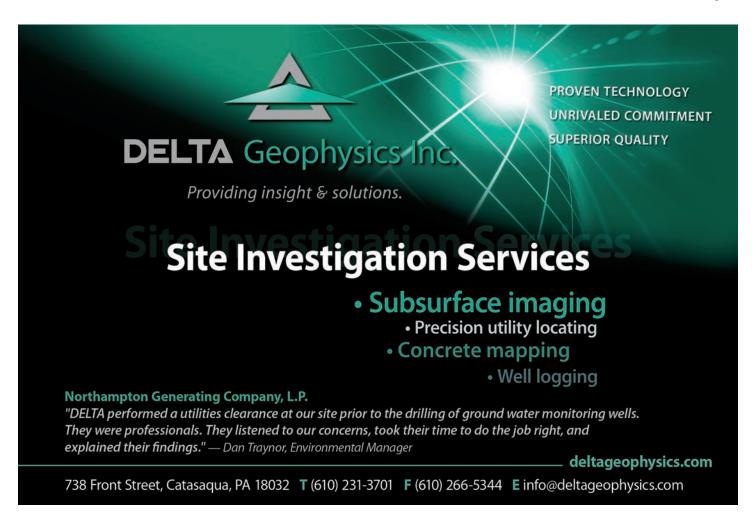
- 1. PCPG considers shale gas exploration and production to be a worthwhile and necessary endeavor that will have a very significant and continuing positive effect on Pennsylvania's economy. Additional shale gas production in Pennsylvania also means more energy independence for the United States. As natural gas is the cleanest burning fossil fuel, there are corresponding positive implications for air and water quality effects throughout the Commonwealth.
- 2. Subjective and selective interpretation of shale gas exploration and development information (as is sometimes reported in print, broadcast media, and the Internet) often conveys erroneous information to the public and to public officials. This can result in the creation of misinformation, unnecessary confusion, and exaggerated concerns. Such reports should be carefully scrutinized for accuracy and partisan agenda.
- Natural gas well drilling and production can and must be done in an environmentally responsible and scientifically sound
 manner while minimizing the potential for adverse environmental impacts. PCPG recognizes that the natural gas drilling
 industry continues to implement and upgrade its best practices, in order to protect the environment throughout the drilling,

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completion and production phases of shale development. Some best practices already implemented by industry, and utilized as appropriate for the given situation or area include:

- Closed-loop drilling systems, diminishing the utilization of earthen pits for drill cuttings and produced water collection and storage;
- Produced water recycling and reuse programs;
- · Natural gas and dual-fuel fired drill rigs and completion equipment;
- "Walking rigs" (which allow for dramatically shortened rig moves on pads, thereby taking less time on any given well pad);
- Water impoundment and piping systems, thereby diminishing water truck traffic;
- Air drilling shallow portions of wells using pneumatic hammer drill bits that increase Rate of Penetration (ROP) two to three times over traditional mud rotary drilling techniques, thereby reducing onsite rig time, fuel usage and emissions; and
- Improved casing and cement designs and optimized cement emplacement procedures reducing the potential for non-zonal isolation and stray gas migration.
- 4. Historically, horizontal drilling and hydraulic fracturing technologies have a low incidence of proven adverse impacts to groundwater and surface water quality. Marcellus Shale natural gas wells typically consist of a vertical bore (drilled with technically sound, time-tested equipment and methods) which is advanced downward to depths of 5,000 to 9,000 feet below the ground surface and then directionally drilled horizontally to tap into the Marcellus Shale formation. Hydraulic fracturing of such horizontal wells is designed with a radius of influence limited to approximately 500 feet

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UPCOMING EVENTS

Two-Day P.G. Review Course for the Practicing Geologist & ASBOG Exam Candidate

February 5-6, 2015 Four Points by Sheraton Mars, PA

PCPG Annual Meeting

March 31, 2015 Harrisburg Holiday Inn East Harrisburg, PA

> PCPG Job Fair March 31, 2015 Harrisburg, PA

2015 Pennsylvania Groundwater Symposium

May 6, 2015 State College, PA

PA Brownfields Conference

May 13-15, 2015
Erie Bayfront
Convention Center
Erie, PA

Don't forget to check the "Courses & Events" link on PCPG's home page frequently for up to date information on upcoming educational opportunities.



Welcome to the *Student Corner*, a forum for information exchange between students and geologic professionals across the Commonwealth.

PCPG is dedicated to supporting students to inspire the next generation of successful geoscientists. We are delighted to announce two great opportunities for students this year: 1) the PCPG student essay scholarship and 2) the first annual PCPG job fair. Please help us advertise!

This year, PCPG will offer scholarships to two deserving students, worth \$1,000 and \$400 for the first- and second-place winners, respectively. Successful applicants must:

- 1. Be student members of PCPG (student membership only costs \$25/yr),
- 2. Be enrolled full time in either an undergraduate or graduate program in geology or a related major such as Environmental Science or Environmental Engineering, and
- Submit a 500-word essay discussing "Why do you want to be a geologist/environmental professional?" by Saturday, January 31, 2015.

Applications will be reviewed by a committee that may include professional geologists, members of the PCPG Executive Board, past scholarship recipients, and the State Geologist or designee. Winners will be invited to attend PCPG's Annual Meeting on March 31, 2015 in Harrisburg for purposes of receiving the award check and reading the selected essay. Visit the PCPG website for details.

PCPG will be hosting a geology job fair during the Annual Meeting on March 31, 2015. Geology firms and agencies representing a variety of market sectors and regions will be invited to showcase employment opportunities, meet prospective employees, network, and conduct mininterviews. Academic institutions are encouraged to provide van transportation to this event to allow students to participate in this great opportunity (four geoscience departments have already committed). The job fair will be free for students. Students who wish to participate in the afternoon networking luncheon and seminar will be asked to pay a modest registration fee. Please mark this event on your calendar; more information will be provided on the PCPG website in early 2015.

Please submit suggestions or questions regarding students and geology to Dr. Helmke at mhelmke@wcupa.edu.

MEMBER SPOTLIGHT

EARTHRES GROUP, INC.: ACTIVE PCPG MEMBER SINCE 2001

EarthRes was founded in 1995 by Jan C. Hutwelker, P.E. with a goal to build a successful organization with a versatile group of technical client-centered professionals. In the same year Louis F. Vittorio, Jr., P.G. and David R. Horvath, P.G. joined with Jan and the team has not looked back. The EarthRes team is made up of hardworking engineers, geologists, and environmental



scientists who develop solutions for our clients' environmental and engineering challenges. We now serve our clients from offices in Central Bucks County (Greater Philadelphia area) and Morgantown, West Virginia. EarthRes currently employees 60 professionals and continues to grow and evolve to meet our clients' needs. Next month marks a milestone of 20 years in business! EarthRes has proudly been a member of PCPG since 2001 and has assisted PCPG through serving on the Board of Directors and Executive Committee, developing and teaching courses, interfacing with DEP, and advocating the importance of professional licensure to college students and the industry.

In 2010 EarthRes moved into a newly constructed "Green" building, showing our commitment to the environment through the investment in numerous building systems, a complete geothermal heating/cooling system, and a state-of-the-art wastewater treatment plant. The building is currently certified under the LEEDs Silver designation. Our professional staff consists of licensed or degreed engineers from multiple disciplines including environmental, chemical, mechanical, civil, and mining; and degreed, licensed, and certified scientists including geoscientists, geologists, hydrogeologists, biologists, chemists, and environmental scientists. Always an advocate for our clients, we excel at navigating through permitting and regulatory hurdles, while focusing on delivering innovative, sustainable, and integrated solutions that keep our client's businesses moving forward.

EarthRes' core market sectors include: Solid Waste, Mining, Oil & Gas, Industrial and Commercial, and Government. Our services include:

- Air quality permitting and compliance
- Environmental investigation and remediation
- Geological and Hydrogeological studies
- Water resources evaluations: mining, public, industrial, and spring water
- Wetland delineation and permitting
- Water and wastewater treatment

- Mechanical and process engineering
- Mining engineering and mineral processing
- Solid waste engineering
- Landfill gas-to-energy design and development
- Shale gas facility/infrastructure design and permitting
- Land development and stormwater management

For additional information on the above sectors and services, including case studies and brochures, please visit www.earthres.com. We look to continue our clients' successes into our 20th year and beyond.





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around the well bore. It is unlikely that a properly designed and constructed shale gas well will have an adverse effect on the much shallower fresh water aquifer zones, which typically occur within 500 feet or less from the ground surface. Key to the successful installation of shale gas wells is a proper well design, casing and construction program conducted by experienced and competent natural gas drilling operators; detailed permit application submitted by the operators; Pennsylvania Department of Environmental Protection (PA DEP) permit approvals based on a thorough review process; and correct execution and verification of the well drilling, casing, cementing and plugging programs.

- 5. Natural gas drilling and production can and must be conducted in accordance with industry best practices and Federal/
 State/Local oil and gas regulations. Spills of drilling-related fluids and improper disposal of wastes, although infrequent, should all be preventable. The natural gas industry bears responsibility for mitigating the effects of any ground surface releases and using lessons learned to continually improve best management practices. Although rare, stray gas issues can arise from faulty surface and production casing installation and when this occurs, the natural gas industry bears responsibility for mitigation.
- 6. The natural gas drilling industry must continue (as a course of responsible operations) to conduct pre-drill sampling of water sources to establish a baseline for aquifer and surface water conditions and quality in any given proposed drilling area. Although landowner privacy is an important issue, environmental testing data need to be utilized by all parties (industry, academia and government) as appropriate. Better communications and joint utilization of environmental testing data will allow for better characterization of surface and ground water geochemistry and conditions throughout the shale gas plays area.

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- 7. It is important that state agencies such as the PA DEP and the Pennsylvania Department of Conservation and Natural Resources (PA DCNR) (where drilling on state lands) have sufficient resources to enforce existing regulations and/or propose new regulations as appropriate. In addition, these regulatory agencies should continue to conduct research, data-gathering, and database management to document the environmental effects, or lack thereof, of shale gas drilling and development.
- 8. PCPG believes that the careful management of effluent (drilling fluids, flowback water, and production brines) generated during well installation, treatment and production, is a significant concern. Technical research and innovation by industry, trade associations, stakeholders, and government must continue with regard to:

 a) drilling waste volume reduction; b) modification/construction of existing/new

...public concern over the use of chemical additives remains heightened and should be addressed

- treatment facilities with advanced treatment technologies; c) use of on-site treatment and reuse and recycling systems to properly handle remaining water and wastes; and d) induced seismicity related to effluent disposal by deep well injection.
- 9. Of great concern to Pennsylvania citizens is the withdrawal of surface water and groundwater for use in the drilling and hydraulic fracturing processes. PCPG believes that the Water Management Plan component of the well drilling permit application package and the additional required approvals from the Susquehanna River Basin Commission and other regulatory authorities for projects, provides ample protection of Pennsylvania's groundwater and surface water resources and their inherent ecological values. PCPG supports the research of using degraded waters, such as Acid Mine Drainage (AMD), to allow these waters to be viable, economic alternative sources used on well sites. As technology improves, costs are reduced, and regulatory liability issues are addressed this could be a suitable water source in the Commonwealth with the added benefit of reducing the historic impacts of AMD.
- 10. The majority of the volume of completion fluids (hydraulic fracturing fluids) currently utilized by industry consists of water and quartz sand. Small quantities of chemical additives are also typically utilized. The likelihood that the low concentrations of man-made chemical components will impact drinking water supplies is very low. However, public concern over the use of chemical additives remains heightened and should be addressed. The natural gas industry therefore should prioritize continued research and development of completion fluid formulas that reduce and/or exclude the use of hazardous substances, and provide transparent and accessible reporting of completion fluid composition to the public and to regulatory agencies. Efforts made to disclose completion fluid chemistries at specific well sites, as reported on "FracFocus. com" for example, are an important step in gaining the public trust.
- 11. Air quality considerations are important to the Commonwealth of Pennsylvania and its citizens. The natural gas industry (including drilling and production segments) needs to integrate processes for reducing emissions from drill rigs, completion equipment, operating and abandoned wells and compressor stations. Technological advances in natural gas-fired drill rigs and completion equipment should be utilized as a best practice wherever feasible.
- 12. Induced seismicity associated with hydraulic fracture treatments are rare events. However, industry should continue efforts for study of the subsurface structural/tectonic conditions, to better understand the types of conditions where induced seismicity associated with hydraulic fracturing may occur. The natural gas industry should take care to prevent drilling and completing wells near known potentially active faults. In addition, microseismic monitoring should be utilized during hydraulic fracture treatments, to better assess potential induced seismicity in areas thought to be susceptible to such rock movements.

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Summary of PCPG Marcellus Position Statement:

Bad news often travels faster than good news — much of the information in the news over the last several years regarding shale gas exploration in Pennsylvania has contained sensationalized language, inaccurate statements and misrepresentations that have neglected to consider reasoned geologic science. PCPG believes it is important to maintain perspective and understand that:

- Currently in Pennsylvania shale gas production is predominately from the exploitation of the Marcellus Shale. However, exploration is occurring in both shallower Upper Devonian shales and deeper Ordovician Utica Shale, and production is being established from those other shale formations across the state.
- Shale natural gas exploration, like other energy production and industrial endeavors, involves risks that can be successfully managed and controlled, and is a source of significant benefit to the citizens of Pennsylvania. Potential adverse environmental impacts must be recognized and prevented via the use of best industry practices, technological advancements, appropriate regulations and strict enforcement.
- Reliable public education opportunities are readily available and important for the dissemination of accurate information about the geology and technical processes associated with shale gas development.
- Accidental spills of chemicals and/or waste materials to soil, surface water, or groundwater unfortunately
 can and have occurred from industrial, manufacturing, and transportation activities. However, rather
 than discouraging industrial, manufacturing, or transportation enterprises in Pennsylvania, PCPG strongly
 advocates environmental stewardship through best management practices and appropriate regulation
 and enforcement to minimize releases to the environment and to promptly address releases when they
 occur. Such diligence is good for business and the community, as it helps to create and preserve jobs
 while protecting the environment. Existing regulations and enforcement provisions ensure that responsible
 parties are held accountable for damages and for restoration of adverse environmental impacts.
- Continued regulatory and economic pressures on drilling waste management and disposal practices are already resulting in rapid advancements and improvements in waste treatment, waste minimization, and beneficial water reuse/recycling.

Shale gas development is a source of widespread benefit to the Commonwealth of Pennsylvania for boosting our state's economy, increasing our energy independence, lowering energy costs, adding much needed jobs, and providing a cleaner-burning fossil fuel. With proper management, technological innovation and constant attention to Pennsylvania's environment, the benefits of shale gas development are likely to persist for future generations.

Bad news often travels faster than good news – much of the information in the news over the last several years regarding shale gas exploration in Pennsylvania has contained sensationalized language, inaccurate statements and misrepresentations...

THE MAY 2015 PENNSYLVANIA BROWNFIELDS CONFERENCE



General registration for the conference will open in the winter.

For more information and the latest conference updates, visit www.eswp.com/brownfields/

The Pennsylvania Department of Environmental Protection and the Engineers' Society of Western Pennsylvania have announced the next Pennsylvania Brownfields Conference to be held May 13-15, 2015, at the Erie Bayfront Convention Center in Erie. The conference will commemorate the 20-year anniversary of Pennsylvania's Land Recycling Act. Signed into law in 1995, the voluntary cleanup legislation known as Act 2 fosters reuse of former commercial and industrial sites. Pennsylvania's approach to brownfields redevelopment has proven to be a national model for helping to restore environmentally-challenged properties back to useful life and economic prosperity.

New to the conference is the "Best of Land Recycling" contest. Stakeholders are encouraged to nominate unique or impactful projects that were completed as a result of Act 2. All types of brownfield projects are encouraged -- big or small, 20 years old or six months old. If the project was important to your community, everyone at the conference would like to hear about it! Submittals may be considered for verbal presentations, poster display or recognition at the conference. Be sure to submit your nominations soon, as some projects will be featured on Transformation Tuesday Twitter feed. To submit a nomination, visit the conference website at www.eswp.com/brownfields/. The deadline for submittals is January 31.

Organizers hold the conference in different regions of the state each year and develop conference content with input from an advisory panel of industry experts. The conference is packed full of events including mobile workshops; a video showcase of success stories; technical updates on market trends and treatment options; community renewal and redevelopment best practices; and networking opportunities. A tiered track of courses will provide continuing education credits for professionals attending the conference. This is the tenth Pennsylvania Brownfields Conference hosted by PA DEP.

Don't Forget to Contribute to the PA GEOPAC!

Through PA GEOPAC, the official political action committee (PAC) of PCPG, you have an effective way to lend financial support to candidates and legislators who support the legislative goals of our organization, or who are willing to lend an ear to our members. More than 200 trade and professional organizations in the state have formed PACs including doctors, dentists, lawyers, bankers, and builders.

Your donation will help to strengthen our voice when and where it is needed most...right now at the state Capitol, where decisions are being made regarding many topics that affect the business of geology in Pennsylvania.

Mail your check made payable to GEOPAC:

GEOPAC

116 Forest Drive Camp Hill, PA 17011

Contributions may be made by personal check or company check only if from a sole proprietorship or partnership.

Otherwise, no corporate or business checks may be accepted.



Please consider the environment before printing this newsletter.

DEADLINE FOR OUR NEXT NEWSLETTER IS FEBRUARY 20, 2015

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