

# OhioENGINEER

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## HYDRAULIC FRACTURING: ENGINEERING GAME CHANGER



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**For more information, contact us at:**  
Ohio Society of Professional Engineers  
400 South Fifth Street, Suite 300  
Columbus, Ohio 43215

Voice..... (614) 223-1144  
Members Toll Free..... (800) 654-9481  
Fax ..... (614) 223-1131  
E-mail..... OSPE@OhioEngineer.com  
Website..... www.OhioEngineer.com

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**LEADERSHIP VIEWS**

by Owen March, P.E., President, Engineers Foundation of Ohio



**A year of successes**

It seems like only yesterday that I was installed as president of the Engineers Foundation of Ohio (EFO). My year in office went smoothly, due in major part to the dedicated support of our executive director, the EFO staff and the many volunteers that have served as officers and on committees. They all contributed mightily to the continued success of EFO.

During the past year EFO has continued its mission of awarding engineering scholarships and providing educational programs, both to Ohio students and registered professional engineers.

EFO awarded 21 scholarships this past year to deserving engineering students attending Ohio's colleges and universities. In all, 94 students submitted 150 scholarship applications.

Even with the economic conditions that have prevailed this past year, EFO's prudent and secure financial management practices have assured that we have not had to reduce a single scholarship or program. We've been able to do it with frugal financial management, a tight fisted mentality and strong fiscal discipline.

In regard to student programs, the Imagine Engineering Second Grade Coloring Contest allows 7,500 kids to participate in their classrooms after an in-class presentation by an OSPE member. The winners at the state level are awarded prizes and recognized at the OSPE Spring CPD Conference. MATHCOUNTS in Ohio impacts more than 13,000 middle school-aged

children. This past year about 180 students participated at the state level. The winners at the state level are also recognized at the OSPE Spring CPD Conference and they advance to the NSPE national competition. These two programs would not succeed without the efforts of many dedicated volunteers.

The EFO sponsored Engineers Leadership Institute trained 35 engineers and engineering students this year. The two-day seminar featured a nationally recognized leadership training expert.

EFO conducted the Fall CPD Conference in Columbus, as well as seminars in Perrysburg and Independence. These events were strongly supported by the engineering community; they were well attended by OSPE members and non-members.

OSPE and EFO offered a combined total of 58 CPD hours this fiscal year, of which 39.5 were sponsored by EFO. The goal of OSPE and EFO continues to be that of providing quality CPD programs at a reasonable cost.

While the primary sources of funding for EFO are endowments and contributions, the annual EFO Benefit Golf Outing provides significant income to EFO. The golf outing is open to members and non-members.

As you can see, EFO is involved in many worthwhile activities that support and promote the engineering profession. I encourage your support of EFO, whether it be as a volunteer or with your financial contribution, or both.

It has been an honor to be an active part of EFO and the Ohio Society of Professional Engineers.

EFO continues to be successful due to the combined efforts of the membership, our passionate volunteers and our dedicated staff.

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On the cover:

Chesapeake Exploration LLC's Patterson-UTI Energy, Inc. triple rigs drilling in Carroll County, Ohio (just outside of Carrollton on SR-39), July 2011. *Photo credit: Corey McCudden.*

**See story on hydraulic fracturing, page 6.** For more information visit the Ohio Oil & Gas Association at [www.ooga.org](http://www.ooga.org), the Ohio Oil & Gas Energy Education Program at [www.oogeep.org](http://www.oogeep.org), and MacKenzie Land & Exploration, Ltd. at [www.mackex.com](http://www.mackex.com).



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## LEADERSHIP VIEWS

by Tim Schaffer, Executive Director, Ohio Society of Professional Engineers



# Productive, constructive year for OSPE . . . and its leader

This past fiscal year has been a busy and productive one for OSPE. We moved forward on several fronts, providing great programs, products and services for Ohio's professional engineers – second to none.

And that is not by accident. We have a great corps of volunteer leaders in OSPE and EFO both, who give their time, talents and resources. I don't know of any other source where a PE can get so many services and CPD hours at the bargain prices we offer to our members. And despite enduring what some are saying is the beginning of the next recession, we are as stable as

any trade or professional association in Ohio. Thank you to all of our OSPE and EFO officers for your help and guidance!

In spite of a very busy year, one among us has provided hundreds – if not thousands – of hours of skillful leadership. And in spite of it all, he ended the year with a number of accolades that I think you should know about. OSPE Past President Dave Dexter, PE, CPD, FASPE, will downplay his accomplishments, but it's my job to make him accept credit for some superhuman achievements!

Just this July, Dave was elected to

the NSPE Board of Directors representing the Central Region. He will serve Ohio and NSPE for a two-year term that will take him to quarterly

national board meetings in Alexandria, Virginia. What I have not told him about are all the other "ceremonial things" he gets to do as an NSPE "VIP"!

About that same time, Dave was nominated for, and awarded, the David E. Dension Award from the Ohio Board of Building Standards. This prestigious award is coveted by the code community. It is presented annually to individuals who have demonstrated outstanding integrity, professionalism and untiring dedication to the development and support of Ohio's construction standards and for diligent work to improve the knowledge, understanding and effectiveness of code enforcement in Ohio.

Dave earned this award in part by his volunteer time spent as a member of the Constituent Code Scoring Group, which reviewed State of Ohio code changes and provided feedback to the Ohio Board of Building Standards.

Dave also served this past year as president of the Central Ohio Chapter of the American Society of Plumbing Engineers. This man was in demand

this past year, and we benefitted from his time as president.


So the next time you see Dave, shake his hand and tell him, "Job well done." He pulled more than his share this year, and he deserves a hearty "thank you!"



< Dave Dexter, PE, CPD, FASPE, (right foreground) serves as Ohio's representative at the NSPE House of Delegates Annual Assembly in Las Vegas this past July.

Guest Contributors & Writers...

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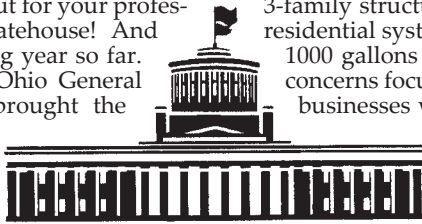
## LEGISLATIVE UPDATE

by Jeff Kennedy, P.E., Vice President, OSPE Legislative & Government Affairs



# We watchdog at Statehouse for Ohio PEs

OSPE is watching out for your professional interests at the Statehouse! And it has been an interesting year so far. The start of the 129th Ohio General Assembly in January brought the state some big changes, including a Republican-led administration and legislature, PE's heading most Ohio Department of Transportation Districts and a host of new legislation.



To date, OSPE is monitoring 22 bills this session. We are also guarding against any legislative attempts to consolidate the State Board of Registration for Professional Engineers & Surveyors with other licensing boards.

Through testimony given by our past president Scott Sands, PE, OSPE has weighed-in with opposition to House Bill 32 (sponsor: Rep. Ron Amstutz). House Bill 32 would exempt from the Professional Engineers and Surveyors Law the preparation of plans or drawings for a sewage treatment system or components of a system and measurements concerning such a system or components that are necessary to comply with the Household and Small Flow On-site Sewage Treatment Systems Law. We are concerned that the legislation would prohibit the design by PEs of residential treatment systems for 1, 2 and

3-family structures and small flow non-residential systems, with flows less than 1000 gallons per day. Our particular concerns focus on two areas: (1) small businesses with flows less than 1000 gallons per day which may have significant quantities of chemical (such as fats and oils from food preparation, for example) waste included and (2) the use of gravity leachfields as engineered drainage.

While House Bill 32 did unfortunately pass the Ohio House, it now moves on to the Ohio Senate, where OSPE will strive to educate senators about this issue, offer testimony and seek improvements for the benefit of the public and Ohio PEs.

We extend our gratitude to Reps. Jay Goyal (D-73rd District) and Dan Ramos (D-56th District) for opposing House Bill 32 and for working with OSPE, the State Board of Registration for Professional Engineers & Surveyors, and the Professional Land Surveyors of Ohio.

We are carefully monitoring House Bill 169 sponsored by Rep. Sandra Williams (D-11th District), which would revise the laws governing the issuance of many professional licenses. While the bill's objective is to put former felony convicts back to work after they've made restitution, we are concerned that the bill will limit our Board's discretion to deny a license to an individual unless their crime is directly related to their occupation. In accordance with NSPE's Code of Ethics, currently our State Board of Registration can deny or revoke the registration of any professional engineer or professional surveyor following the conviction for any crime involving moral turpitude. Moral turpitude involves the commission of a crime involving dishonesty, theft, solicitation, illegal drug use and trafficking,

income tax evasion, voluntary manslaughter, and murder, among other crimes (please see Ohio Engineer, Vol. 68, Issue No. 1, p. 17).

While House Bill 169 was submitted as a proposed amendment to the biennial budget, House Bill 153, this proposed amendment was not adopted. However, the budget conference committee included a House provision that allows a person convicted of a felony to obtain a barber license if the person were convicted before applying for the license. This provision was included in the final version of the budget signed by Gov. Kasich on June 30.

House Bill 114, the transportation budget, was signed by Governor Kasich on March 30. There were concerns that the bill would not include monies for Ohio Public Works Commission programs. However that was remedied with the substitute legislation, which put up \$150 million for State Capital Improvement Program Grants and \$49 million for the Revolving Loan Program. The substitute bill also included provisions for public-private partnerships and paying unsuccessful bidders for their plans on certain projects.

OSPE past president N.E. Nilsson, PE, is also working with Ohio University Dean and Moss Professor of Engineering Education Dennis Irwin, PhD, PE, to re-craft legislation that would result in college and university engineering professors being required to become professional engineers.

Finally, we hosted a successful PE's Legislative Day on Capitol Square on May 10 with 73 participants and high-quality speakers. The program was worth up to 4.0 CPD hours. After the seminars, several participants met with their legislators.

We encourage you, Ohio's PEs, to be actively involved with your respective legislators, both state and federal, to ensure the development and passage of wise legislation beneficial to our fellow citizens.

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# LEGISLATION SUMMARY: 129TH OHIO GENERAL ASSEMBLY

PERFORMANCE BUDGETING, House Bill 2 (Snitchler)	To require performance audits of most state agencies, loan funds to state agencies & local public offices to pay for these audits, & make an appropriation.	<b>Status:</b> Companion legislation, Senate Bill 4, signed into law.
CONTAMINATED SITE REMEDIATION, House Bill 10 (Sears)	To authorize refundable tax credits through 2017 for the completion of a voluntary action to remediate a contaminated site & for the return of such sites to productive use & to exempt persons through 2017 who have been issued covenants not to sue under the VAP for certain fees & penalties for 1 year after the issuance of such a covenant.	<b>Status:</b> 3rd hearing in House Ways & Means, 02/23/11.
SEWAGE PLANS, House Bill 32 (Amstutz)	To exempt from the Professional Engineers & Surveyors Law the preparation of plans or drawings for a sewage treatment system or components of a system & measurements concerning such a system or components that are necessary to comply with the Household & Small Flow On-site Sewage Treatment Systems Law.	<b>Status:</b> Passed House, 06/14/11. Referred to Senate Agriculture, Environment & Natural Resources, 06/15/11. OSPE opposes.
TURNPIKE COMMISSION, House Bill 40 (Damschroder)	To make the Ohio Turnpike Commission responsible for major maintenance & repair & replacement of grade separations at intersections of any turnpike project with county & township roads.	<b>Status:</b> 3rd hearing in House Transportation, Public Safety & Homeland Security, 03/02/11.
WATER PERMITS, House Bill 72 (Damschroder)	To require the Director of Environmental Protection to consider, to the extent allowable under the Federal Water Pollution Control Act, specified factors before issuing NPDES permits for sewerage systems, requiring & approving long-term control plans for wet weather discharges from sewerage systems, & enforcing provisions of that Act as applied to sewerage systems.	<b>Status:</b> Introduced in House & referred to Health & Aging, 02/01/11. Companion legislation to Senate Bill 22.
PERFORMANCE BUDGETS, House Bill 81 (Snitchler, Rosenberger)	To require performance budgeting by most state agencies.	<b>Status:</b> Introduced in House & referred to State Gov't & Elections, 02/02/11.
LABOR REQUIREMENTS, House Bill 102 (Young)	To prohibit state agencies from requiring or prohibiting certain labor requirements as a condition of performing public works & to prohibit the appropriation of state funds for public works when political subdivisions require or prohibit certain labor requirements.	<b>Status:</b> Amended bill reported from House Commerce & Labor, 05/11/11.
TRANSPORTATION BUDGET, House Bill 114 (McGregor)	To make appropriations for programs related to transportation & public safety for the biennium beginning July 1, 2011 & ending June 30, 2013.	<b>Status:</b> Signed by governor & effective 03/30/11.
TRANSPORTATION PARTNERSHIPS, House Bill 151 (McGregor)	To authorize the Department of Transportation to enter into public-private partnership agreements.	<b>Status:</b> Referred to House Transportation, Public Safety & Homeland Security, 03/15/11.
BIENNIAL BUDGET, House Bill 153 (Amstutz)	To make operating appropriations for the biennium beginning July 1, 2011, & ending June 30, 2013, & to provide authorization & conditions for the operation of state programs.	<b>Status:</b> As signed by governor, 06/30/11, the engineers & surveyors board will transition to biennial renewal & DAS will make recommendations for state gov't reorganization, including less state agencies.
PROFESSIONAL LICENSURE, House Bill 169 (Williams, S.)	To revise the laws governing issuance of certain professional licenses.	<b>Status:</b> 1st hearing in House State Gov't & Elections, 04/05/11. Via HB153, a person convicted of a felony may obtain a barber license if s/he were convicted before applying for it.
PUBLIC CONTRACTS, House Bill 176 (Beck)	To limit the magnitude of change orders on public improvements required to be competitively bid.	<b>Status:</b> 2nd hearing in House Commerce & Labor, 06/08/11.
SMALL BUSINESS RULES, Senate Bill 2 (Hughes)	To adopt a new small business rule review procedure.	<b>Status:</b> Signed by governor, 03/04/11. Effective in early June.
PERFORMANCE AUDITS, Senate Bill 4 (Schaffer)	To require performance audits of most state agencies, to loan funds to state agencies & local public offices to pay for performance audits, & to make an appropriation.	<b>Status:</b> Signed by governor & effective, 04/05/11.
COLLECTIVE BARGAINING, Senate Bill 5 (Jones)	To make various changes to laws concerning public employees, including collective bargaining, salary schedules & compensation, layoff procedures, & leave.	<b>Status:</b> Signed by governor, 03/31/11; effective at end of June.
GOV'T REGULATIONS, Senate Bill 11 (Cafaro)	Among other things, to enact the Common Sense Regulation Act to improve state agency regulatory processes, especially as they relate to small businesses.	<b>Status:</b> Referred to Senate Gov't Oversight & Reform, 02/02/11.
SMALL BUSINESS, Senate Bill 12 (Kearney)	To generally require that state agencies set aside a certain amount of purchases for which only small business enterprises may compete.	<b>Status:</b> Referred to Senate State & Local Gov't & Veterans Affairs, 02/02/11.
MORTGAGE SERVICERS, Senate Bill 14 (Skindell)	To require registration of residential mortgage servicers, to regulate residential mortgage servicers, & to adopt civil & criminal penalties for violations of the bill's provisions.	<b>Status:</b> Sponsor testimony in Senate Financial Institutions, 06/15/11.
WATER PERMITS, Senate Bill 22 (Schaffer)	To require the Director of Ohio EPA to consider, to the extent allowable under the Federal Water Pollution Control Act, specified factors before issuing NPDES permits for sewerage systems, requiring & approving long-term control plans for wet weather discharges from sewerage systems, & enforcing provisions of that Act as applied to sewerage systems.	<b>Status:</b> Amended bill passed House 06/07/11. Informally passed Senate, 06/14/11. Senate concurred in House amendments, 06/15/11.
LABOR REQUIREMENTS, Senate Bill 89 (Jordan)	To prohibit state agencies from requiring or prohibiting certain labor requirements as a condition of performing public works & to prohibit the appropriation of state funds for public works when political subdivisions require or prohibit certain labor requirements.	<b>Status:</b> Referred to Senate Insurance, Commerce & Labor, 03/08/11.
WATER REPORTS, Senate Bill 96 (Stewart)	To require a community water system's annual report to its customers to include info re the amount of water lost by the system during the transmission of water between the source waters utilized by the system to the consumers serviced by the system.	<b>Status:</b> 1st hearing in Senate Agriculture, Environment & Natural Resources, 04/05/11.
WATER DISTRICTS, Senate Bill 164 (Obhof)	To declare that a water resources project of a regional water & sewer district remains under the jurisdiction of the district after the municipal annexation of the territory where the project is located, to establish contracting authority for regional water & sewer districts regarding the conveyance of water resource projects to municipal corporations, & to expand the scope of the contracting authority of a county sewer district when conveying water supply facilities & sewer facilities to a municipal corporation.	<b>Status:</b> Introduced in Senate, 05/03/11. Referred to Agriculture, Environment & Natural Resources, 05/10/11.

## ENVIRONMENTAL ENGINEERING FEATURE

by Peter MacKenzie, CPG, and Martin R. Shumway, PE, MacKenzie Land & Exploration, Ltd., and Thomas E. Stewart, Executive Vice President, Ohio Oil & Gas Association

# Hydraulic Fracturing: Engineering Game Changer

Ohio has been the “Heart of it All” of energy in many ways, for a long time. A saltwater driller “discovered” oil in 1814 in Noble County at a depth of 475 feet in a well known as the Thorla-McKeel. At the time, refining technology to unlock the energy contained in crude oil had not been developed. Ohio’s first commercial oil well was placed into production in 1860, producing from the Macksburg sand in Washington County. (This event was preceded a few months by Colonel Drake’s famous discovery in Pennsylvania.) Commercial natural gas production began in 1884.

In the 1880’s, copious amounts of oil were being discovered in the Trenton Lima-Findlay trend in northwest Ohio. In 1896, Ohio operators produced 24 million barrels of oil from this field and drilled more than 6,000 wells, which made Ohio the nation’s leading producer of oil. Mechanical well stimulation to enhance production was becoming extensive, and most wells were stimulated with nitroglycerin or “nitro-shot,” a crude and unrefined but effective technique. Drillers learned quickly that blasting (fracturing) the reservoir significantly increased production rates and volumes over natural rates.

### Refining technology

By this time, refining technology had advanced sufficiently to begin delivering refined energy consumer products from crude oil in Pennsylvania. Ohio crude oil proved troublesome because of high sulfur content which muddled up the refining process. John D. Rockefeller tasked John Wesley Dyke, a refining expert, and Herman Frasch, a German chemist and engineer, with figuring out how to handle the sulfur in the refining process to enable refining of Ohio oil. This work was completed at the Solar Refinery in Lima. With a significant technological achievement they were successful, and, in fact, the Solar Refinery is still operating today, celebrating it’s 125th year of operation this year.

### Completion technology

Ohio developed a reputation as an energy farmland as drilling expanded eastward to shallow geologic formations (Berea, Big Injun, Cow Run, Germantown, Macksburg, Weir). The Clinton Sandstone has long been recognized a gas reservoir and is generally a “tight” sand (low permeability and porosity). Conventional fracturing (nitro-shot) was employed from discovery in 1887 to 1940 when the reservoir was deemed to be played out.

Hydraulic fracturing was first com-

mercially employed in 1948, and was a huge technological advancement. Ohio producers quickly recognized the importance of this new technology and by 1951 its use revitalized the development of Clinton gas drilling, which continues today.

Today, when hydraulic fracturing (often called “frac” or “frack”) and blasting occur together in an article or conversation, be clear and understand that the discussion is about old technology, old practices from another era, issues not germane to the understanding or debate of the day. Blasting is pretty easy to understand. We see explosions in movies, so we can see the carnage that blasting can impart. “Blasting” also sounds scary and dangerous. There is no blasting in hydraulic fracturing. To characterize modern hydraulic fracturing techniques as blasting is simply naive and disingenuous and reflects a poor understanding of the process.

### Hydraulic fracturing – An engineering achievement

So what is this technique, first used in Ohio sixty years ago, called hydraulic fracturing? Until recently, wells were drilled and completed vertically. Hydraulic fracturing in a vertical well can achieve far greater propagation of fractures away from the borehole, which greatly increases flow rates and ultimate recoveries of the wells.

Simply put, hydraulic fracturing utilizes the power of hydrostatic pressure and fluid dynamics in order to induce controlled fractures to increase permeability within the reservoir rock. Fractures are created and propagated in the reservoir rock using hydraulic pressure.

A producer fractures a well to increase the flow of oil and gas from the rock, known to contain oil and gas, but where the rock’s natural permeability does not allow oil and gas to reach the wellbore in sufficient volumes. To fracture a well is to create a pathway for fluid flow to the well bore in sufficient volumes to enable economic production. Hydraulic fracturing makes possible what nature otherwise had made impossible.

Whether vertical or horizontal, the well bore is cased with steel pipe and cemented in place. At this point, there are no pathways for anything to enter the borehole or travel to the surface. The reservoir rock is completely isolated from the borehole, fresh groundwater (usually within 200 feet of the ground surface), and the surface. The borehole is then perforated with a shotgun like slug, making several small holes through the steel, cement, and into the reservoir rock. Perforations serve as the pathway for the fluid being injected



Photo credit: Corey McCudden

during hydraulic fracturing and then as the conduit for hydrocarbons to enter the borehole and travel to the surface through the steel pipe.

Reservoir rock is under pressure at depth, and is confined above and below by rock layers (which provide a reservoir seal or trapping mechanism for the accumulation of hydrocarbons). During the hydraulic fracturing process, fluid is pumped at highly controlled, engineered, and monitored rates and pressures. It is critical to a successful hydraulic fracture operation that the only rock impacted is the reservoir rock containing hydrocarbons. If a fracture extends into an underlying layer, the well could be lost (often underlying formations have high concentrations of brine, that can invade the reservoir rock and render it uneconomic). When the hydraulic fracturing operation is complete the pumps are turned off and the fractures in the reservoir rock close instantaneously, held open only by the proppant delivered into the fractures. Induced fractures do not and cannot continue to propagate without the pumps and fluid applying pressure.

Petrophysicists study rock properties of the reservoir to understand how the material will behave. Engineers design fluids capable of performing as intended at depth, while transporting proppant in a slurry thousands of feet down and thousands of feet horizontally, through pipe perforations and into the induced fractures in a manner that when the pumps stop, the proppant stays put (i.e., props the fractures open and providing permeability) rather than flow back up the pipe with the fluid.

Water and proppant are the principle components of hydraulic fracture fluids. In fact, water and sand make up about 98% (by volume) of the components - the remaining 2% are engineered additives to optimize the fluid properties to the unique geological characteristics of the reservoir,

## ENVIRONMENTAL ENGINEERING FEATURE

depth, and type of proppant. Additives may include various acids, corrosion inhibitors, iron control agents, anti-bacterial agents, scale inhibitors, clay stabilizers, friction reducers, gelling agents, breakers, crosslinkers, pH adjusting agents, and surfactants.

Modern hydraulic fracturing techniques, fluid and proppant design, multi-stage fracture operations, horizontal drilling, and other technological advances have enabled extraction of hydrocarbons from previously uneconomic reservoirs. Hydraulic fracturing combined with horizontal drilling is a ground-breaking, notable technological advance which dramatically increases domestic hydrocarbon reserves.

### Long history of smart, safe, effective operations

Over a million wells have been subjected to hydraulic fracturing in the U.S. and more than 35,000 wells are completed in this way each year. Hydraulic fracturing is applied to most oil and natural gas wells to enhance production, minimize drilling, and recover otherwise uneconomic resources. Approximately 90 percent of currently producing oil and gas wells have been fractured, and the process continues to be applied in new ways to increase production of hydrocarbons from "tight" gas sands, shale deposits and coalbeds. Despite the shouting from the steeples by the environmental movements and a popular movie, there are no confirmed incidents of groundwater contamination as a result

of hydraulic fracturing. Furthermore, hydraulic fracturing is safely and effectively regulated by all of the states in which it occurs.

Since the early 1950s there have been over 80,000 wells in Ohio that have been completed using hydraulic fracturing at depths ranging from 1,000 to 10,000 feet in depth. On June 4, 2009, Scott Kell, deputy director of the Ohio Department of Natural Resources (ODNR) oil and gas regulatory program, appeared before the U.S. House of Representatives Committee on Natural Resources, Energy and Mineral Resources Subcommittee, during which he testified that, "After twenty-five years of investigating citizens complaints, (ODNR) geologists have not documented a single incident involving contamination of ground water attributed to hydraulic fracturing." Kell's testimony has been replicated by regulators across the country.

### Regulatory oversight

The ODNR closely regulates fracturing operations. In 2010 the Ohio General Assembly enacted improvements to Ohio's oil and gas law to require that Ohio producers submit to the ODNR a complete copy of well stimulation logs and fluid constituents for each well that is hydraulically fractures. ODNR then makes these logs available for the public record. The same law also updated well construction requirements. Afterwards, a peer critique of Ohio's regulatory program conducted by a national multi-stakeholder organization that includ-

ed the environmental community found that Ohio's hydraulic fracturing regulatory program is "overall, well-managed, professional and meeting its program objectives." (STRONGER, [www.strongerinc.org](http://www.strongerinc.org))

The research and engineering that goes into drilling and hydraulic fracturing is immense. Hydraulic fracturing is focused entirely on the reservoir rock, which is why the process is not responsible for a single case of groundwater contamination in its long history of use. In fact, today's technology is far more accurate, refined, engineered and controlled than at any time in history. Hydraulic fracturing is a safe and effective process and may be one of the greatest conservation advances of our lifetime. Higher recoveries with smaller footprints and fewer lost or abandoned hydrocarbons. Technological advances such as horizontal drilling and hydraulic fracturing allow access to reserves that were not previously accessible commercially or otherwise in many cases.

If we want access to cheap, abundant, domestically produced energy, hydraulic fracturing is a vital part of the solution. If our economy does not need this domestic energy, or if we are willing and can afford to import energy from foreign sources, or if the economy can sustain the use of more expensive, less efficient, less abundant energy, well, that is a different conversation.

**For further information, visit [ooga.org](http://ooga.org), [oogeep.org](http://oogeep.org) and [mackex.com](http://mackex.com). More resources are listed at [OhioEngineer.com](http://OhioEngineer.com).**

## Counterpoint: Horizontal hydraulic fracturing has risks

by Jack Shaner, Deputy Director, Senior Director of Legislative & Public Affairs, Ohio Environmental Council

The oil and gas industry argues, correctly, that fracturing is not a new technology. Indeed, tens of thousands of wells have been fractured in Ohio alone. What is new, though, is horizontal hydraulic fracturing ("HHF"), in which a well is drilled first vertically to the desired depth, and then horizontally.

### A triple threat — risks for air, land and water

So what's the big concern about HHF? The answer starts with the land. A traditional drilling site takes up the space of about a football field. To make room for additional infrastructure, waste pits and equipment, a single HHF well site can take the space of six football fields.

The concern continues with the air. At the well site, large condensate tanks store gas and remove moisture, emitting benzene, volatile organic compounds, greenhouse gases and a variety of toxic contaminants.

And then there's the water. An HHF well can require up to five million gallons of water. Hundreds of chemicals are added to the water to reduce friction and

help keep sand (used to prop open tiny fissures in the shale) in suspension during the fracturing process. A number of hazardous chemicals may cause health risks that range from rashes to cancer.

### Burning water

Video posted on the Internet shows people igniting their tap water. Industry spokespersons dismiss such incidents as anecdotal. They claim methane migration is from gases that are naturally occurring in the aquifer from which a well draws its water, not a fracturing job a mile beneath the Earth's surface.

Cracks are beginning to form in industry's blithe reassurance. In a peer-reviewed study published earlier this spring by the National Academy of Sciences, scientists at Duke University found that levels of flammable methane gas in drinking water wells increased to dangerous levels when those water supplies were close to natural gas wells.

The scientists also found that the type of gas detected at high levels in the water was the same type of gas that energy companies were extracting from

thousands of feet underground, strongly implying that the gas may be seeping underground through natural or man-made faults and fractures, or coming from cracks in the well structure itself.

On the heels of that study came this bombshell: The U.S. EPA official who oversaw the George W. Bush administration's 2004 study of hydraulic fracturing says its conclusions about safety have been exaggerated for years. As reported by the New York Times, the former high-ranking official says the study didn't deem all fracturing to be safe, and it didn't justify exempting all forms of it from drinking water protections, as Congress did in 2005.

### Time out

Is fracturing a safe technology? Is there a way to get the gas without endangering our ground water? The U.S. EPA has begun a new study to examine these very questions. The Ohio Environmental Council supports a moratorium on deep shale fracturing until the EPA study is complete. This is one call we need to get right—before we dig.

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*Newly installed OSPE and EFO officers*



In a ceremony on May 20 in Cleveland, NSPE Vice President Dan Wittliff, PE, DEE, FNSPE, installed the 2011-2012 OSPE Board of Directors and EFO Board of Trustees. The OSPE and EFO boards will guide the legislative, educational and service activities for the engineering profession in Ohio. The officers are, from left to right, **OSPE Vice President of Membership Fred Tito, PE**, of the JDI Group in Holland; **OSPE President-Elect Dave Kuhn, PE**, of Feller Finch & Associates in Maumee; **OSPE Treasurer John Banton, PE, FNSPE**, of Stantec Consulting Services in Cincinnati; **OSPE President Bruce Larcomb, PE, PS**, retired from the International Code Council in Westerville; **OSPE Past President Dave Dexter, PE, CPD, FASPE**, of Korda Engineering, Inc., in Columbus; **EFO Past President and Treasurer Owen March, PE**, retired from Burgess & Niple in Columbus; **EFO President-Elect Joe Warino, PE, PS, FNSPE**, of the City of Canfield; Installing Officer NSPE Vice President Dan Wittliff, PE, DEE, FNSPE; and **EFO Secretary Jim Montgomery, PE**, of Shook Touchstone CM in Dayton. Not pictured are **OSPE Secretary Howard Jones, PE**, retired from American Electric Power; **OSPE Vice President of Legislative & Government Affairs Jeff Kennedy, PE**, of Shaffer Johnston Lichtenwalter & Associates, Inc., in Mansfield; and **EFO President Russ Critelli, PE**, of the Mannik & Smith Group in Maumee.



OSPE President Bruce Larcomb, PE, (left) presents Past President Dave Dexter, PE, with a gavel plaque in thanks for Dexter's year leading OSPE.



EFO President Russ Critelli, PE, (right) presents Past President Owen March, PE, with a gavel plaque in thanks for his year at the helm of EFO.

## Rep. Nan Baker discusses 'Re-Energizing Ohio' at Legislative Luncheon

OSPE members shared a meal with special guest speaker State Rep. Nan Baker, R-Westlake, at the Legislative Luncheon, hosted by the OSPE-PAC, May 20. Following the meal, Baker discussed legislation in the House Economic and Small Business Development Committee, which she chairs, and she provided an update on the aerospace and bio-sciences industries.

The lunch seminar was worth **0.5 CPD hours**.

A first-generation small business owner, Rep. Baker serves

on the House Committees for Education; Local Government and Public Administration; and Ways and Means.

Rep. Baker has been an elected office holder since 1996, having served as a member of the Westlake Board of Education, a three-term member of the Westlake City Council, and in the Ohio House of Representatives.



Rep. Nan Baker

## SPRING CPD CONFERENCE

# Spring CPD Conference lets engineers earn 12.5 CPD hours & enjoy Cleveland

The OSPE Spring CPD Conference, hosted by the Northeast Chapter in May, attracted 160 people to Cleveland for education, business meetings and social activities. OSPE extends a special thank you to OSPE Spring CPD Conference Chairman **Lee Hooper, PE**, president of Osborn Engineering, for a great 2011 program! Thanks also to **Jim Simler, PE**, of the Northeast Chapter for his leadership and to **Pat Valente**, executive director of the Ohio Fuel Cell Coalition, for his help in securing speakers and our technical tour at NASA Glenn Research Center.

Educational sessions at the "Re-Energizing Ohio" conference were worth 12.0 continuing professional development (CPD) hours and focused on managerial and ethics topics. In addition, a bonus 0.5 CPD hours was awarded to those attending the Legislative Luncheon seminar. Those attending all programs earned **12.5 CPD hours**.

On Friday, May 20, conference participants began their education with Jack Kleinhenz, PhD, who provided perspective on the economy as it relates to engineers. Next, William Hutter, CEO of Sequent, addressed the engineering business implications of healthcare reform. Friday's programming included a technical tour at NASA Glenn Research



**Jack Kleinhenz, PhD**



**Bill Hutter**



**Dave Karpinski**



**Scot Thrapp**

Center, where participants learned about energy and fuel cells.

On Saturday, Dave Karpinski, vice president of NorTech, talked about regional technology clusters as an economic growth strategy. Scot Thrapp of the Ohio Energy Resources Division discussed Ohio's financial incentives and resources for renewable energy and energy efficiency. He also highlighted commercial and industrial case studies. A panel led by Ohio Fuel Cell Coalition Executive Director Pat Valente made the case for the growth of the fuel cells industry within Ohio. Next, John Greenhalge, MBA, executive director of the State Board of Registration for Professional Engineers & Surveyors presented real-life ethics investiga-



< Ohio Fuel Cell Coalition Executive Director Pat Valente led a panel discussion making the case for the growth of the fuel cells industry within Ohio. He also secured OSPE's fuel cell tour at NASA Glenn Research Center.



**John Greenhalge, MBA**



**Imre Szauter, MSEE**

tions resulting in disciplinary action for participants to review and discuss. Imre Szauter, an engineer turned lobbyist for the American Motorcyclist Association, talked about how engineers can transition their careers. The final education session of the two-day conference was a panel discussion moderated by John Troy, PE, FNSPE, discussed the role of PE's in Higher Education and legislation introduced in the last Ohio General Assembly

to license upper-level engineering faculty. The panelists included Greenhalge; Dennis Irwin, PhD, PE, dean of engineering at Ohio University; and Nils Nilsson, PE, FNSPE, a past president of OSPE.

While engineers earned CPD hours, their guests enjoyed candy-making, a tour of the Cleveland Botanical Garden, a ride on the Cuyahoga Valley Scenic Railroad, and shopping in Little Italy and Peninsula.

Guests and engineers reunited Friday evening at the Presidents' Party, a dinner honoring the outgoing OSPE and EFO presidents. The party featured the annual officer installation ceremony, as well as entertainment by a national performer, Antoinette Tredanary, and her trio of musicians.



**Panelists Dennis Irwin, PhD, PE, John Greenhalge, MBA, & Nils Nilsson, PE, FNSPE.**

## Thanks, Cleveland conference sponsors

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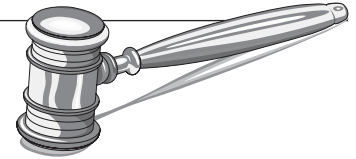
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To sponsor the 2012 Conference, please call OSPE at 1-800-654-9481 (in Columbus, 614-223-1144).



## State Board accepts 10 settlement agreements

The Ohio State Board of Registration for Professional Engineers and Surveyors accepted 10 settlement agreements in June.

### Failed to provide continuing education documentation within 30 days

The Ohio Board said Ronald Booth, PE, of Auburn, Alabama, and Toledo resident Edward C. Rohr, PE, each failed to provide his continuing education documentation for 2008, 2009 and 2010 during the Ohio Board's annual audit. Ohio law requires that professional engineers (PE's) and surveyors (PS's) respond within 30 days to the Ohio Board's request for information. Although Booth completed the continuing education requirements, the Ohio Board said it did not receive his continuing education documentation until 13 months after the initial audit. Booth admit-

ted to violations of Ohio law and agreed to pay a \$500 fine and receive a written reprimand. Rohr agreed to voluntarily relinquish his Ohio PE license for violations of Ohio law.

### Gross negligence, incompetency, or misconduct

The Ohio Board has reported that Roy Lee Brown, PE, of Birmingham, Alabama, voluntarily surrendered his PE license in Kentucky in order to avoid disciplinary action by the Kentucky Board. The Ohio Board said such disciplinary action would have involved allegations that he affixed his seal and signature to engineering drawings that were prepared by an unlicensed firm and contained errors and omissions of the acceptable standards of engineering practice. Based on the Kentucky Board's action, Brown agreed to voluntarily relinquish his Ohio PE license for violating Ohio law. Once his license is restored in Kentucky, he would be eligible for reinstatement of his Ohio license.

John F. Germ, PE, of Chattanooga, Tennessee, voluntarily surrendered his PE license in Oklahoma in order to avoid disciplinary action by the Oklahoma Board involving an allegation of aiding and assisting an unlicensed firm in offering or providing engineering services without a certificate of authorization (CoA), said the Ohio Board. Based on the Oklahoma Board's action, Germ agreed to voluntarily relinquish his Ohio PE license for violating Ohio law. He would be eligible for reinstatement of his Ohio license once his license is restored in Oklahoma.

### Aiding & abetting illegal practice

According to the Ohio Board, Gary Elliott, PS, of Hannibal, Missouri, was found to have aided and abetted the unlicensed practice of surveying in Ohio by affixing his seal and signature to surveying work product prepared by Red Plains Surveying Company, an Oklahoma City, Oklahoma, based company that did not have a CoA to offer or provide surveying services in Ohio. He agreed to pay a \$500 fine and receive a written reprimand for violating Ohio law.

### Noncompliance with Standards for Boundary Surveys; No CoA

The Ohio Board said a Gambier resident, David R. Mills, PS, entered into a settlement agreement in order to avoid further disciplinary action based on a complaint that he performed a mortgage survey and boundary survey that did not comply with the Standards for Boundary Surveys (OAC 4733-37) and the Standards for Mortgage Location Surveys (OAC 4733-38). In addition to the complaint, the Ohio Board said Mills' company, Tracy and Mills Surveyors, did not have a CoA to practice surveying in Ohio. He agreed to pay a \$1,000 fine, reimburse the property owner for the cost of the survey and cease operating the firm until the firm is granted a CoA from the Ohio Board.

### Did not complete CPD; Committed fraud

The Ohio Board said North Canton resident David B. Morgan, PE, and Kettering resident Sara L. Sowers, PE, each contacted the Ohio Board to report that he or she did not complete the continuing education requirement prior to completing the 2011 license renewal process, despite having indicated on the renewal form that the requirement was met. Morgan and Sowers were among those the Ohio Board audited for continuing professional development credit. Morgan agreed to voluntarily surrender his PE license for violating Ohio law. Sowers agreed to pay a \$2,000 fine and receive a reprimand for violations of the same sections of Ohio law.

### Providing surveying with no CoA

Red Plains Surveying Company, based out of Oklahoma City, Oklahoma, agreed to pay a \$2,500 fine and discontinue offering or providing surveying in Ohio until the firm is granted a CoA. Red Plains Surveying Company was, according to the Ohio Board, providing surveying services in Ohio at a time when the firm did not have a CoA, which is in violation of Ohio law.

### Exam cheating

The Ohio Board said a Columbus resident, Richard A. Schlarman, was observed by Ohio Board staff looking at another examinee's answer sheet on multiple occasions during the Fundamentals of Engineering examination at the Columbus testing site. After the exam, Schlarman was interviewed by an Ohio Board investigator and admitted to cheating, according to the Ohio Board. He agreed that he would be prohibited from taking any NCEES exam in Ohio or any jurisdiction for one year.

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## State Board converting to biennial renewal cycle

Pursuant to changes in Ohio law, the State Board of Registration for Professional Engineers and Surveyors will convert to biennial registration renewal beginning with the 2012 renewals. All professional engineers and professional surveyors will renew every other year and be required to obtain 30 hours of continuing professional development (CPD) during the two year cycle. If a licensee exceeds 30 CPD hours during the two year cycle, up to 15 hours may be carried forward into the subsequent renewal period. The biennial renewal fee will be \$40.

## State Board suspends Springboro man's dual licenses

The Ohio State Board of Registration for Professional Engineers and Surveyors said Springboro resident William R. Yoakam, PE, PS, was charged with violations of Ohio Revised Code 4733.20(A)(1) and (5) and Ohio Administrative Code 4733-19-01 and 4733-35-08 based on the revocation of his PE

license in Kentucky and failing to report the revocation to the Ohio Board within 30 days. At a hearing, the examiner found Yoakam guilty of the charges filed by the Ohio Board. At its June meeting the Ohio Board suspended Yoakam's PE and PS licenses for two months and fined him \$1,000.



# OSPE delivers high quality, low cost CPD hours, EFO raises funds for youth & engineering education

## OSPE & NSPE recruit members

OSPE recruited 120 new members in fiscal year 2011. This is, in part, due to an OSPE-NSPE direct mail campaign. Promotional letters highlighted member benefits, such as free CPD hours. OSPE also promoted Supporting Friends membership to vendors and others not otherwise qualifying for OSPE membership.

## Free CPD at September 23 golf outing

The 20th Annual EFO Benefit Golf Outing will occur Friday, September 23 at Bent Tree Golf Club in Sunbury. EFO is honoring last year's rates for the 2011 scramble. Register a four-person team, register as an individual player, or sponsor the event! Proceeds support youth and professional education programs.

Before the scramble, EFO is offering a seminar, worth 2 CPD hours, free to registered golfers and OSPE members.



## Hold November 10-11 for 15 CPD hours

EFO is again offering 15 CPD hours of education in a two-day program this November 10-11 at the Fawcett Center in Columbus. Call 1-800-654-9481 (in Columbus, 614-223-1177) to be added to the brochure distribution. EFO will offer 30%-50% discounts to OSPE members!

## Legislative Day was successful

The 2011 Ohio Engineers Legislative Day, May 10, was held at the Capital Club in Columbus. Thank you to our co-sponsor, the American Society of Civil Engineers – Ohio Section. OSPE mem-

bers received a 50% discount on the registration fee and the seminar was packed with 72 participants.

The program, worth 4 CPD hours, included seminars on: **“Aligning Higher Education to the Needs of Business,”** by Board of Regents Chancellor Jim Petro; **“Board Consolidation,”** by State Board of Registration Executive Director John Greenhalge and Member Jim Mawhorr, PE; **“Back to the Basics,”** by ODOT Chief Engineer Jim Barna; **“Promoting Infra-**



Jim Petro

**structure With the State Legislature,”** by ASCE Regional Governor Kevin Carpenter, PE, PS; **“Innovative Funding Mechanisms for Infrastructure,”** by ASCE lobbyist Brian Pallasch, CAE; and **“Internships for STEM Schools,”** by Cory Neugebauer, a teacher at Metro High School. Afterward, a number of participants met with legislators.

## EFO raises \$15,000 for education

The 2011 “Pass the Hat” campaign and a new donor calling program raised \$15,000 for EFO's youth and professional education programs. Thanks to John Banton, PE, FNSPE; Howard Jones, PE; David Kuhn, PE; Bruce Larcomb, PE, PS; and Owen March, PE, for generating over \$3,000 via the calling program.

## Welcome, new OSPE members

OSPE is pleased to welcome these 23 new members from April 7, 2011 through July 16, 2011:

### Cincinnati Chapter

Ronald K. Bartley, P.E.

### Dayton Chapter

Tim J. Barrett  
Claude A. Harden, P.E.  
Scott Hootman  
Donnie Lindsey  
Mark Salveter, P.E.  
Jonathan Takacs

### Franklin County Chapter

Matthew C. Boothe  
Jami Caldwell, P.E.  
Thomas J. Castor, P.E.  
John Hayes, Jr.  
Hunter Kelly, P.E.  
Sarah Long

### Franklin County Chapter (cont'd.)

Tim Snider, P.E.  
Mark Stoneburner, P.E.

### Lima Chapter

Alexander F. Yazdani, P.E.

### Mahoning Valley Chapter

Nathan A. Knapp

### North Central Chapter

Zachary Edwards

### Northeast Chapter

Tracey A. Arkey  
Priscilla Diem, P.E.  
Tyler C. Tamburlin  
James Wojcik, P.E.

### Tuscarawas Valley Chapter

Trent Nichols, P.E.

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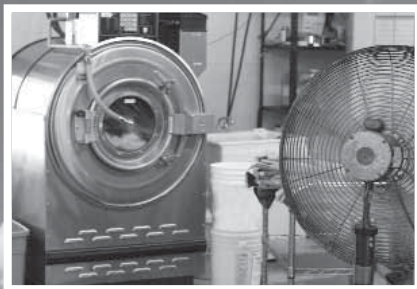
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