

Shale Gas Roundup



Potter County, Pa.

1st Quarter

2016

NGRC meeting draws full house

Lessons in engineering, chemistry, geology and public policy were blended into a detailed presentation as the Potter County Natural Gas Resource Center hosted a standing-room-only public meeting at the Gunzburger Building in Coudersport.

Topping agenda items were presentations by representatives of the Pa. Dept. of Environmental Protection (DEP) and JKLM Energy about the incident that occurred at JKLM's Reese Hollow well pad, and the results of the investigation thus far.

In mid-September, when JKLM was starting to drill a deep Utica shale gas well off North Hollow Road in Sweden Township, the company used prohibited chemicals to retrieve a broken drill bit from a depth of about 570 feet.

A portion of the watery mixture containing chemicals that DEP prohibits from use at that shallow depth leaked through a crack in the rock structure. Within two days, some residents reported turbidity in their water supplies. Both DEP and JKLM have been conducting extensive tests. They shared their results during the NGRC meeting.

Speakers emphasized that, today, tests do not show that any water supply contains pollutants from the spill in excess of safe drinking water standards, but monitoring will continue for many months. Chemicals used in the process were described as a surfactant, isopropanol and "rock oil," which is a lubricant for air hammers. Some members of the audience continued to press for more details on the specific chemical constituents and their concentrations.



John Hamilton (right), environmental program manager, and other members of DEP's delegation address attendees at the NGRC meeting.

(story continues on page 2)

Website established for unanswered questions

Potter County Natural Gas Resource Center (NGRC) has established a website to address citizens' concerns about the release of chemicals into an aquifer at a JKLM Energy gas-drilling site in Sweden Township. Some of the questions posed during the Dec. 17 NGRC meeting in Coudersport could not be addressed as the meeting reached adjournment. Purpose of the website is to provide answers to those questions and others. Those seeking to access the site should visit the Potter County website, pottercountypa.net. A box titled "Q & A from Natural Gas Resource Center" appears on the home page.

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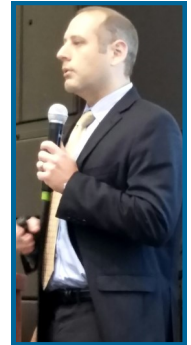
JKLM's Scott Blauvelt

Water samples have been taken from home wells, surface water and sources for two public water systems – Coudersport Borough and Charles Cole Memorial Hospital. Both have switched to alternative supplies as a precaution. JKLM plans to install treatment systems on some of the private water systems that were affected and has installed monitoring wells which will be used to check water quality.

Plugging of the gas well, in compliance with DEP standards, was completed in November. Scott Blauvelt, JKLM's director of regulatory affairs, said the company does not expect to move forward with that well, but JKLM does have plans for extensive drilling

in Potter County in the coming years. Officials said the company has invested more than \$100 million in Potter County over the past few years, much of it paid to private landowners for subsurface drilling rights.

Marcus Kohl, director of DEP's Williamsport Regional Office, discussed the agency's response to the Sweden Township incident. JKLM will eventually pay a monetary penalty.



DEP's
Marcus Kohl

Attendees of the Dec. 17 meeting also heard:

--a report on a statewide task force that's making recommendations for pipeline construction regulations;

--information on solar and wind energy projects in the region;

--an update on the data logger/water monitoring project in the upper Allegheny River and Mill Creek being implemented by the Potter County Conservation District, Upper Allegheny Watershed Assn. and other partners;

--a report on the proposed local partnership involving the Triple Divide Watershed Coalition and the U.S. Geological Survey for a groundwater monitoring project;

--details on broad-based efforts to persuade DEP to include delineated sourcewater protection zones in its consideration of permit requests for land disturbances, particularly gas/oil drilling.

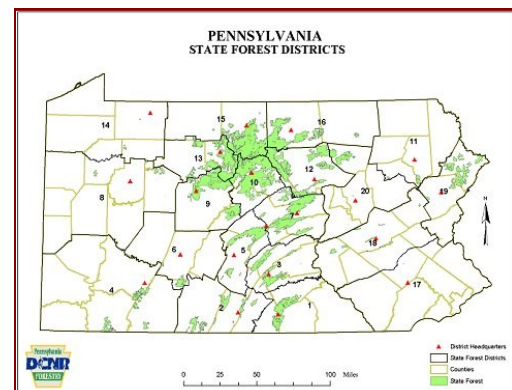
State forest drilling before high court

Pa. Supreme Court will hear arguments as early as March in a case over drilling in state forests. At issue is the state's constitutional obligation to conserve public natural resources. Two issues are before the high court:

— What is the proper standard for reviewing government actions and laws to see if they comply with the environmental rights amendment?

— Is it constitutional for the General Assembly to continue transferring money generated from state forest drilling out of a special fund set aside for conservation purposes?

Roughly 700,000 acres of state forests are available for natural gas development through existing state or private leases.



Water Quality Work Group seeks piece of gas company fine



Members of the Potter County Water Quality Work Group met in December to continue their work on an ambitious agenda that will extend far into the new year and beyond. Among discussion items was a report from the group's chairman, Jason Childs, watershed specialist with the Potter County Conservation District, on efforts being pursued to obtain funding for a series of environmental stewardship projects.

Childs said a committee recently convened to develop a series of priorities for local projects that could benefit from a pending financial penalty that the Pa. Dept. of Environmental Protection (DEP) is expected to levy against JKLM Energy LLC. Sanctions are pending as a result of a chemical release into an aquifer at a gas well site in

Sweden Township last September.

It's possible that DEP will keep the money for its own internal uses, potentially to pay for technology upgrades, but Potter County officials plan to press the agency to set up a distribution system that benefits the area impacted by the chemical release.

Childs reported that priorities established by the Conservation District's Watershed Development and Water Resources Committee are:

- 24/7 water quality monitors for seven public drinking water supplies;
- support for a groundwater characterization study being conducted by the Triple Divide Watershed Coalition and the United States Geological Survey;
- Japanese knotweed eradication projects in sections of the upper Allegheny River watershed;
- fish habitat improvement work in the Mill Creek/upper Allegheny area;
- long-term investment in local environmental stewardship projects through an endowment fund.

Work Group members also heard reports from the Upper Allegheny and Genesee Headwaters watershed associations and discussed options for engaging the First Fork, Pine Creek and Kettle Creek watershed associations in future activities. They discussed the efforts by a sister organization, the Triple Divide Watershed Coalition, to protect public drinking water sources and provide support for water system operators.

Discussions were also held on the waning interest in volunteer water monitoring activities; a reported unknown materials release near Mill Creek just east of Coudersport Borough that DEP was asked to investigate; the addition of canoe/kayak launch sites in Burtville and Genesee, on the heels of a site being established earlier this year in Roulette; ongoing cleanup activities at illegal dumpsites in Potter County, and a number of projects being planned by the Potter County Conservation District.

Next public meeting of the Potter County Water Quality Work Group is scheduled for 8 am on Monday, Feb. 8, at the Gunzburger Building in Coudersport. More information on the group's activities is available from Jason Childs at 274-8411, extension 111.

Attending the December meeting were Chris Mitterer, Pete Ryan, Earl Brown, Jim Clark, Mary Anne Heston, Jason Childs, Frank Weeks, Darrell Davis, Bob Volkmar, John McLaughlin and Commissioners Susan Kefover, Doug Morley and Paul Heimel.

Jobs are out there for qualified applicants

So where are all these shale gas jobs?

The answer has many layers. Forecasts of a meteoric rise in gas-drilling this decade were off-base due to falling prices at the wellhead, a slower-than-expected rollout of new pipeline networks to carry the gas, and many other factors. Still, there is activity in some parts of Pennsylvania. Those seeking work in the industry can still find it if they are willing to travel, as long as they meet some basic criteria.

Pennsylvania College of Technology in Williamsport is tuned into the job market through its Shale Training and Education Center. Administrators have tweaked course offerings to adapt to the changing workforce needs, according to David Pistner, director of energy initiatives.

“It’s a higher level of troubleshooting and skill attainment now,” Pistner explained. “Those can be the hardest positions for a company to fill. It’s a blending of electronics, mechanical components and other skill areas.”



At Penn College’s drill-rig simulator, one of only three in the country, students get a chance to handle the 31-foot lengths of drill pipe that are connected in a string to drive a drill bit more than a mile below the surface.

Andrew Maykuth photo

Students who earn a two-year associate degree in a new field — mechatronics engineering technology — emerge with knowledge of hydraulics, power-drive systems, mechanics and other skills. They are in high demand in Pennsylvania or anywhere else in the industry. The same degree is also a ticket to jobs in other fields, such as instrumentation technology, robotics, automation, industrial engineering, process control and others. That’s just one of the Penn College options. There are also numerous four-year and two-year degree programs, as well as one-year certificates and other offerings.

Training for even the most basic gas and oil industry skills is provided on the Williamsport campus to prepare individuals for entry-level “roustabout” jobs. Other courses teach basic skills in safety, environmental protection and heavy equipment operation. Instruction in welding and plastics is also offered.

Right now, Pistner said, many Penn College students are being hired in southwestern Pennsylvania and West Virginia, where the gas and oil industry is busier. However, there are jobs closer to home if an applicant can acquire the education and be persistent.

“Contrary to popular belief, there are some opportunities here when it comes to the whole spectrum of jobs,” Pistner emphasized. “For instance, welders are in great demand and should continue to be needed, based on the plans for more pipeline infrastructure. And a welder makes about \$32 per hour plus benefits.”

Penn College works closely with the industry to make sure it is training workers for jobs that really exist, Pistner pointed out. For details, call 1-800-367-9222, or visit pct.edu.

'Gasification' project nearing Potter County



Residents not currently serviced by natural gas would have the option of tapping in under the regional 'gasification' initiative.

Not all residential and commercial energy users have access to natural gas. A growing campaign to bring a distribution network to these potential customers, often referred to as "gasification," is spreading across Pennsylvania and knocking on Potter County's door.

A Regional Gas Utilization Initiative fueled by government grants started last year in Clinton, Centre and Mifflin counties. Two gas line extensions will get underway soon in Clinton County, bringing service to about 600 customers at a cost of \$15 million.

A project of the SEDA-Council of Governments, the initiative is also developing gas service expansion sites in

Columbia, Juniata, Lycoming, Montour, Northumberland, Perry, Snyder and Union counties. Fewer than 30 percent of homes in the project area are heated with natural gas.

Don Kiel, study manager for SEDA-COG, said the project also will identify potential funding strategies to sustain and attract economic development and reduce energy costs. Potential locations for establishment of new natural gas service will be assessed based on property and heating fuel types; heating systems; building square footage; industries with growth potential; employment; and proximity to natural gas distribution service areas.



Don Kiel

Kiel said SEDA-COG is evaluating newer technologies, such as virtual pipelines that can be established to provide service to "gas islands" not connected to existing distribution networks. Compressed natural gas can be delivered by truck to a decompression station located at the site of a major user, often a larger commercial business.

The virtual pipeline model can serve a single user or a limited network of users connected by a small pipeline network, including residential areas. Additional options may include small natural-gas-to-electricity power plants and similar technologies. "We've had really great participation in the initial phase with the first three counties," Kiel said. "If the second phase with the additional eight counties goes as well, we're optimistic this is going to be a significant project."

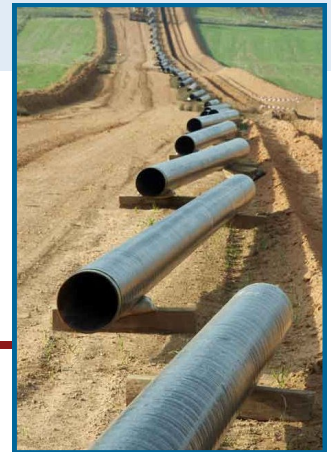
News & Notes

Governors in Pennsylvania, West Virginia and Ohio have signed a compact to jointly develop markets for shale gas, attract new businesses, expand gas-related infrastructure (including pipelines), and encourage state-owned and state-affiliated universities to collaborate on research. Some 85 percent of the growth in U.S. gas production since 2012 is due to wells in those three states.

Snyder County in central Pennsylvania has been chosen for a major electrical generating station using natural gas. The former coal-fired Sunbury Steam Plant in Shamokin Dam will be retrofitted and become the Panda Hummel Generating Station, fueled by gas. Commercial operations are expected to open in 2018, serving large power markets that include Philadelphia and the New York metropolitan areas.

Flurry of pipeline activity underway

More than 1,500 shale gas wells have been drilled and capped in Pennsylvania, while companies wait for an infrastructure to carry their gas to market. With a glut of gas available, the energy giants have used the lull to map out an underground network across much of Pennsylvania. Tens of thousands of pipeline miles are proposed during the next 10 years, according to state officials.



Companies are using the lull in gas-drilling activity to aggressively build a pipeline infrastructure that will carry shale gas to market.

Among the larger projects:

- The Leidy Southeast Expansion Project is a recent addition to Williams' Transco Pipeline. The 30-mile series of loops moves through Columbia, Luzerne, Lycoming and Monroe counties in Pennsylvania and parts of New Jersey. Its price tag was about \$738 million.
- Williams Partners' 178-mile Atlantic Sunrise Pipeline will move through 10 counties, including Lancaster and Lebanon, as it carries gas from northeastern Pennsylvania to markets in the Mid-Atlantic and southeastern states. The \$3 billion pipeline is expected to be operational by July 2017.
- Mariner East I pipeline, which previously carried oil, has been repurposed to carry gas products. It cost \$2.5 billion to make the switch along the 350-mile Sunoco Logistics pipeline. Last year it began carrying propane through 14 counties in southern Pennsylvania, including several in the midstate.
- Mariner East II pipeline will also carry gas. The Sunoco Logistics pipeline will cost \$3 billion to build and will span 350 miles when complete. It is expected to be operational in late 2016 and will move along the same path as Mariner East I.
- Columbia Pipeline Group's Mountaineer Xpress Pipeline will carry natural resources from southwestern Pennsylvania through parts of West Virginia and Ohio. The \$2 billion, 165-mile pipeline will move gas through Columbia's existing infrastructure in Pennsylvania and connect with the Mountaineer Xpress in Ohio and West Virginia. It's expected to be in service by late 2018.
- A \$1 billion PennEast Pipeline will cover 114 miles in eastern Pennsylvania and New Jersey. Construction is slated to begin by August 2016, and it is expected to be in service by Nov. 1, 2017. The pipeline is a partnership among AGL Resources, NJR Pipeline Company, Public Service Enterprise Group, SJI Midstream, Spectra Energy Partners and UGI Energy Services.
- The 124-mile Constitution Pipeline will move from Susquehanna County into parts of New York. The \$700 million project is the result of a partnership among Williams Partners, Cabot Oil & Gas, Piedmont Natural Gas and WGL Holdings. It is expected to be operational in late 2016.

State officials forecast that, over the next 10 years, Pennsylvania could also see 25,000 miles of gathering lines, which connect wells to processing stations, and another 4,000 to 5,000 miles of transmission pipelines. Pipeline projects are expected to create jobs, but they won't yield tax revenue for Pennsylvania. Unlike surrounding states, the commonwealth does not tax pipelines as property. By contrast, Constitution Pipeline will generate about \$13 million in annual property tax revenue throughout four counties in New York.

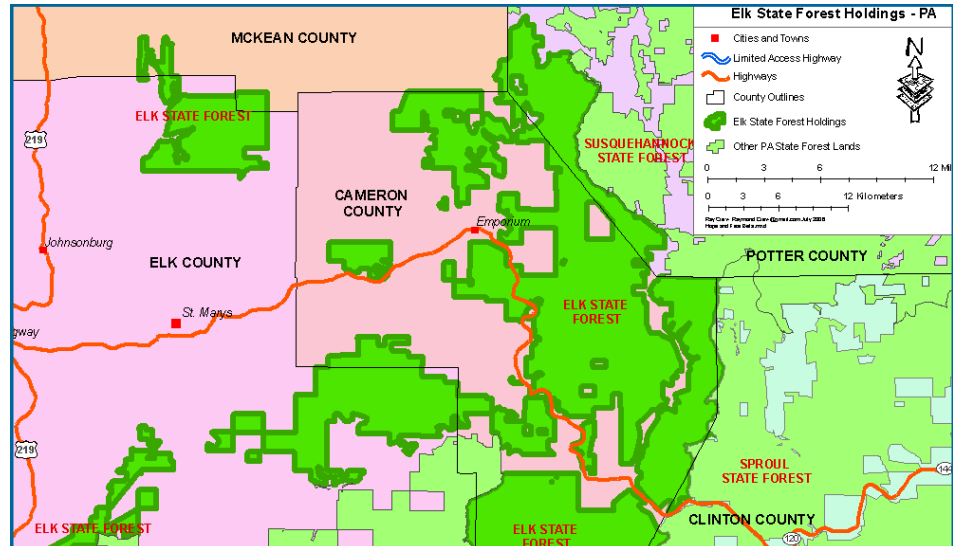
Some property owners have voiced their opposition to pipeline plans. Often, when residents won't agree to having their land used for pipelines, companies will attempt to exercise eminent domain rights.

Plenty of drilling in Elk State Forest

(By Jeanne Wambaugh, district forester for the Elk State Forest.)

Elk State Forest, one of 20 state forest districts found in our state, has undergone some major changes in the last three years.

While the rest of the state (both private and public land) was wrestling with the shale gas “boom” back in 2008 through 2010, the Elk State Forest in Cameron, Elk and McKean counties went relatively unaffected. Yes, there were a few wells drilled, but it was minimal when compared to many other counties. Fast-forward to today and things have changed. A portion of the Elk State Forest located in the East Branch Dam and Clermont areas has been the focal point



of the majority of the gas activity in the region. Seneca Resources, owner of the mineral rights, is operating in full development mode.

Here is a summary of activities:

- eight new well pads with anywhere from 4 to 13 gas wells per pad.
- one well pad expanded to allow for five additional gas wells.
- 36 miles of new pipelines to transport the gas to the market.
- one compressor site.
- 20.5 miles of improvements made to both public use and administrative roads.
- two freshwater impoundments capable of holding more than 50 million gallons.
- Two rigs working around the clock drilling wells.

At first glance, this may seem like a lot of changes away from the traditional big-woods type forests that are associated with our region. However, Seneca Resources has been a cooperative partner in making these changes and working with us to design both short-term and long-term benefits to the forest and the public.

Some 3,090 conifer trees have been planted, located within pipeline rights-of-way. Another 290 hardwood and soft mast-producing trees have been planted. Some 6.3 miles of new and potential snowmobile trails have been located within pipeline rights-of-ways. Also in these corridors, about 6.6 acres of new and potential wildlife food plots have been established. Seneca has also cooperated on stream quality improvement projects. All in all, it has been quite a change and it will continue to change for the

foreseeable future. But with cooperation and foresight it can be a benefit to all in the end. If you have any concerns about the gas-related activity or any questions, please contact the Elk State Forest District at its Emporium office, or call 814-486-3353.

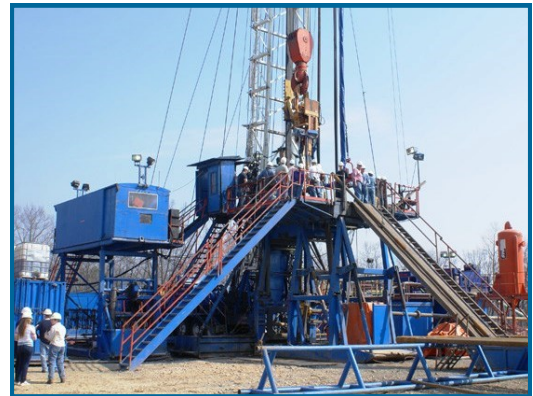
Forecasting gas activity is tricky

One of the best measures of natural gas activity is the “rig count,” which tallies the equipment out in the field. That number decreased nationally by 170 rigs in 2015. Almost every company scaled back its drilling plans, and the ripple effect hit gas field service companies such as Halliburton and Schlumberger.

Experts see the trend continuing well into 2016 as a prolonged period of oversupply keeps prices low. Shale gas companies pumped the brakes in 2015 after years of rapid increases in the amount of natural gas they pulled from Pennsylvania’s Marcellus and Utica shales. Several companies confirmed that they will continue to curb production in response to low prices, oversupply, lack of pipeline infrastructure and tepid demand amid warmer-than-normal temperatures.

Chesapeake Energy, Cabot Oil and Gas, and Southwestern Energy have focused on the “dry gas” region in Pennsylvania’s northeastern counties, but even they pulled back after years of nearly uninterrupted production increases.

Still, the U.S. Energy Information Administration predicts that natural gas production will grow at least modestly in 2016, because companies continue to become more efficient at drilling wells quickly and getting more gas out of fewer wells. “Most of the growth is expected to come from the Marcellus Shale, as the backlog of uncompleted wells is reduced and as new pipelines come online to deliver Marcellus natural gas to markets in the Northeast,” the EIA said. The Northeast Region also has a backlog of about 2,800 wells that have been drilled and are waiting for higher prices or a connecting pipeline to arrive.



Energy companies pay thousands of dollars daily to lease massive gas rigs, so it only follows that they’re being more conservative in their drilling activities while low prices linger and a pipeline network continues to be built.

News & Notes

Natural gas processing giant Williams Energy is being sold to Energy Transfer Equity of Dallas, Texas, for about \$37.7 billion. The merger will create the third largest energy franchise in North America and one of the five largest global energy companies.

A Pennsylvania congressman has joined officials from New Hampshire in pressing the Inspector General of the U.S. Dept. of Energy to hold the Federal Energy Regulatory Commission more accountable on pipeline-related issues. Rep. Matt Cartwright of Moosic said constituents have complained that FERC does not adequately consider public input or fulfill its obligation to ensure that natural gas infrastructure projects are in the public’s best interest.



This publication is produced by the Natural Gas Resource Center in Coudersport, Pennsylvania. Previous editions are available in the website, pottercountypa.net. Anyone with story ideas or comments should contact Paul HeimeI (pheimel@pottercountypa.net).