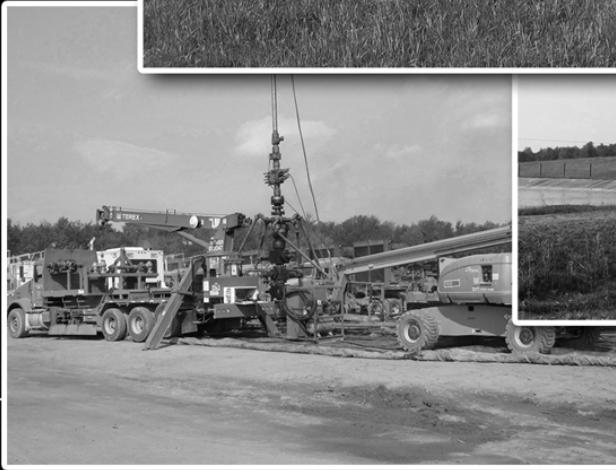
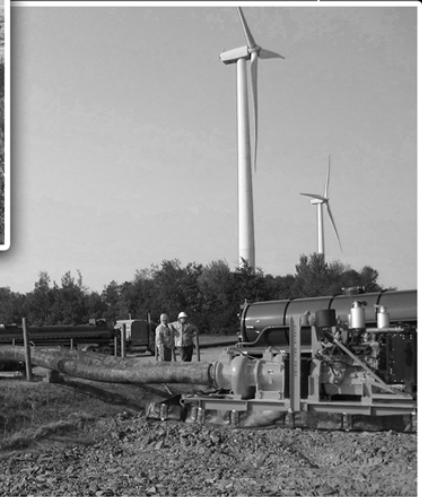


# Joint Northcentral Regional Business Trip Report

*September 21-22, 2010*



Citizens Advisory Council to the  
Department of Environmental  
Protection



Conservation and Natural Resources  
Advisory Council to the Department  
of Conservation and Natural Resources

Joyce Hatala  
*Chair*

*Adopted November 16, 2010*

Susan M. Wilson  
*Executive Director*

C. Allen Sachse  
*Chair*

*Adopted November 17, 2010*

Kurt Leitholf  
*Executive Director*

**CITIZENS ADVISORY COUNCIL  
(October 2010)**

**GOVERNOR'S APPOINTMENTS**

**Jolene E. Chinchilli** – Lancaster Co.; B.S. Biology, Chatham College; M.S.P.H., Environmental Science and Engineering, University of North Carolina; Former Executive Director, Pennsylvania Office of the Chesapeake Bay Foundation; appointed June 27, 1996; current term expires January 2012.

**Gail M. Conner, Esquire** – Delaware Co.; JD, Widener University School of Law; B.S., University of Wisconsin; Founder and President of G&C Environmental; appointed June 17, 2005; current term expires January 2011.

**S. Pat Lupo, O.S.B.** – Erie Co.; B.A. Elementary Education, Mercyhurst College; M. Ed. Science Education, Clarion State University; Director, Lake Erie Allegheny Earth Force; appointed June 29, 1988; current term expires January 2013.

**Richard J. Manfredi** – Bucks Co; B.S. Public Administration, Shippensburg University; M.S. Public Administration, Marywood College; President & CEO of RJM Public Affairs; appointed June 13, 2002; current term expires January 2011.

**John J. Walliser, Esquire** – Allegheny Co.; B.A. Political Science, University of Pittsburgh; JD, University of Pittsburgh School of Law; Allegheny Valley Conservancy Board of Directors 2004-Present; Allegheny County Bar Association, Environmental Law Section Council, 2006-present; appointed October 2008; current term expires 2013.

**Peter R. Wilshusen, Ph.D.** – Union Co.; B.A. Environmental Studies, University of Vermont; M.F.S. Master of Forest Science in Environmental Policy, Yale School of Forestry and Environmental Studies; Ph.D. Resource Policy and Behavior, School of Natural Resources and Environment, University of Michigan; Co-director, Bucknell University Environmental Center 2005-2009; Associate Professor of Environmental Studies 2003 - present; appointed October 2008; current term expires January 2012.

**PRESIDENT PRO TEMPORE OF THE SENATE APPOINTMENTS**

**Cynthia Carrow** – Allegheny Co.; B.S. University of Pittsburgh; Executive Vice-President of Western Pennsylvania Conservancy; President of the Board of Directors, Conservation Consultants, Inc.; appointed February 1997; current term expires January 2013.

**Joyce Hatala** – Lackawanna Co., B.A. Anthropology, University of Notre Dame; M.A. Anthropology, University of Minnesota; CEO of Joyce Hatala Associates; appointed June 2005; current term expires January 2011.

**Walter N. Heine, P.E.** – Cumberland Co.; B.S. Civil Engineering, Drexel University; M.S. Sanitary Engineering, University of Michigan; Chief Executive Officer, Walter N. Heine Associates, Inc. and Township Supervisor; former Director of the Federal Office of Surface Mining, U.S. Department of the Interior; and former Associate Deputy Secretary for Environmental Protection, PA DER; appointed August 11, 1983; current term expires January 2013.

**Curtis N. Kratz** – Montgomery Co.; Kellogg Rural Leadership Institute at Penn State; Consultant – Environmental and Government, elected to Board of Directors for the PA Farm Bureau, represents members from Berks, Chester, Delaware and Montgomery Counties; appointed June 2005; current term expires January 2011.

**Burt A. Waite** – Crawford Co.; B.A. Geology, College of William & Mary; M.S. Geology, University of Vermont; Senior Geologist in charge of environmental services for Moody & Associates; appointed November 17, 1998; current term expires January 2012.

**SPEAKER OF THE HOUSE APPOINTMENTS**

**James Clauser** – Carbon Co.; Associates Degree, Williamsport Area Community College; District Manager, Carbon County Conservation District; Certified Land Management and Water Control Erosion & Sedimentation Control Specialist; Board Member for PA Western Pocono Trout Unlimited; appointed June 2009; current term expires January 2012.

**Eric R. Conrad** – Cumberland Co.; B.A., Geology, New England College; M.A., Urban and Regional Planning, Penn State University; President, E. R. Conrad and Associates, LLC; appointed November 2009; current term expires January 2011.

**Janet B. Keim** – Lehigh Co; B.S., Elementary Education, Kutztown University, Retired Substitute Teacher; appointed August 22, 2006; current term expires January 2013.

**Thaddeus Stevens** – Tioga Co.; Associate Applied Science, Forestry, Paul Smith's College New York; PA Association of Realtors, Legislative Committee; Delegate to North Central Sewage Agency for Gaines Township, Tioga County; appointed April 9, 1997; current term expires January 2011.

**David Strong** – Jefferson Co.; B.S. Chemistry, Mansfield University; Independent Environmental Scientist; appointed October 31, 1996; current term expires January 2013.

**SECRETARY OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**John Hanger** – Dauphin Co.; 1979 graduate of Duke University; 1984 graduate of University of PA School of Law; 1984-1988 public advocate with Commentary Legal Services, Inc.; 1988-1993 legal counsel to PUC Commissioner Joseph Rhodes; 1993-1998 PA PUC Commissioner; 1998-August 2008 President and CEO of Penn Future; Secretary of Pennsylvania Department of Environmental Protection, August 2008 - present.

Executive Director – Susan M. Wilson

# CONSERVATION AND NATURAL RESOURCES ADVISORY COUNCIL (October 31, 2010)

## GOVERNOR'S APPOINTMENTS

- Ellen M. Ferretti** – Wilkes-Barre, PA; B.S. Environmental Sciences, Wilkes College; Vice President Pocono Forest and Water Initiative and Special Assistant to the President, Pennsylvania Environmental Council; term expires January 2012.
- Thomas J. Kerr** – Kempton, PA; B.S. Business Administration, Temple University; Sustainability Consultant for the City of Allentown; term expires January 2011.
- C. Allen Sachse** – Moscow, PA; B.S. Recreation and Park Administration, Penn State University; Executive Director, Delaware & Lehigh National and State Heritage Corridor Commission; term expires January 2011.
- L. Richard Sayles** – Harrisburg, PA; B.S. Developmental Psychology, Penn State University; Dauphin County Area Coordinator for the Retired Senior Volunteer Program (RSVP) of the Capitol Region; term expires January 2013.
- Elizabeth Tavares** – Midland, PA; Technical Business Analyst II, Highmark Blue Cross Blue Shield; term expires January 2013.
- Margaret Welker** – Hawley, PA; B.S. Environmental Resource Management, Penn State University; Supervisor – Public Programs, PPL Corporation; term expires January 2012.

## PRESIDENT PRO TEMPORE OF THE SENATE APPOINTMENTS

- Rocco S. Ali** – North Apollo, PA; B.S. Biology and Chemistry, Geneva College; M.S. Orthopedics and Neurology, University of Pittsburgh; Physical Therapist and Clinical Supervisor, Nova Care Outpatient Rehabilitation; term expires January 2011.
- Thomas S. Buzby** – Lebanon, PA; B.S. Public Administration, Virginia Commonwealth University; Vice President, Corporate Affairs, Weaber, Inc.; term expires January 2010.
- L. Stockton Illoway** – Phoenixville, PA; B.A. Liberal Arts, Harvard University; M.S. Financial Science, American College; Senior Sales Associate, L. Stockton Illoway; term expires January 2011.
- Herbert Eric Martin** – Ohiopyle, PA; B.S. International Recreation Marketing, University of Maryland; Owner/General Manager, Wilderness Voyageurs, Inc.; term expires January 2012.
- Walter N. Peechatka** – Camp Hill, PA; B.S. Forestry, Penn State University; Senior Advisor, Versant Strategies; term expires January 2010.
- Blaine A. Puller** – Smethport, PA; B.S. Forestry, Penn State University; retired Forest Manager; term expires January 2012.

## SPEAKER OF THE HOUSE APPOINTMENTS

- Clifford C. David, Jr.** – Doylestown, PA; B.A. Psychology, Bucknell University; B.S. Botany, University of Vermont; M.S. Organization and Management, Antioch College; President, Heritage Conservancy; term expires January 2011.
- William C. Forrey** – Camp Hill, PA; B.S. Landscape Architecture; M.S. Regional Planning, Penn State University; Project Manager, Arora and Associates, P.C.; term expires January 2012.
- Paulette Viola** – Slippy Rock, PA; B.S. Education, Edinboro University; M.S. Education, Slippy Rock University; Ph.D. Science Education/Natural Sciences, University of Pittsburgh; Professor, Resource Management, Slippy Rock University; term expires January 2011.
- Gary M. B. Kribbs** – Havertown, PA; B.A. Geology, University of Toledo; M.S. Geology, University of Toledo; President, AEON Geoscience, Inc.; term expires January 2010.
- William E. Mifflin** – Philadelphia, PA; B.S. Ornamental Horticulture, B.S. Recreational Management, M.Ed. Recreation Administration, Temple University; Executive Director, Philadelphia Hospitality, Inc.; term expires January 2012.
- Steven J. Ropski** – Erie, PA; B.S. Biology, Gannon College; Ph.D. Ecology/Systematics, Indiana State University; Professor, Biology, Gannon University, Erie, PA; term expires January 2010.

## SECRETARY OF THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

**John Quigley** – Hazleton, PA; B.A. Economics; M.A. Public Administration; formerly Government Relations Manager for PennFuture.

**Chairman** – C. Allen Sachse

**1st Vice Chairman** – Steven J. Ropski

**2nd Vice Chairman** – Thomas J. Kerr

**Executive Director** – Kurt Leitholf

**Administrative Assistant** – Joan Dupes



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## **Introduction**

The Conservation and Natural Resources Advisory Council (CNRAC) was created by the same legislation that created the Department of Conservation and Natural Resources (DCNR) in 1995. The CNRAC is charged with reviewing all conservation and natural resource laws of the Commonwealth, and with studying the work of the DCNR. It is required to advise the DCNR on its work, and to make recommendations for the improvement of the work of the DCNR.

The Citizens Advisory Council (CAC) was legislatively created in 1971. The CAC is charged with reviewing all environmental legislation, regulations and policies affecting the Department of Environmental Protection (DEP). It is mandated to review the work of the DEP and to make recommendations for its improvement, to study major environmental issues facing Pennsylvania, and to promote sound environmental legislation.

Both councils report their recommendations to their respective state agencies, the Governor, the General Assembly, and the public.

These councils function independently of each other, and yet have sometimes come together in the study and review of issues of common interest. Such is the case of our interest in the development of the Marcellus Shale natural gas in Pennsylvania, as well as abandoned mine drainage (AMD) areas found in the Pennsylvania State Forest system.

This regional business report details Marcellus Shale natural gas development activities on and off state forest-managed lands. This is the second consecutive year that both citizen advisory councils jointly met with representatives of the natural gas industry, state forest managers, and representatives of the communities being impacted by this broad industrial development activity.

## **Site Visits**

### **Tuesday, September 21**

- **Sunbury Generation LP**

This site is located on the west bank of the Susquehanna River in Shamokin Dam and Hummel's Wharf, PA. It lies on 216 acres of land.

This facility has a net generating capacity of 438 megawatts and consumes up to 1.3 million tons of Pennsylvania coal and 1.5 million gallons of fuel oil each year. Coal is received by both railroad and truck, is blended to provide combustion in the boilers, which creates enough electricity to power over 350,000 homes.

Of particular interest to both councils for this trip is the ability of this power generation facility to accept natural gas hydraulic fracturing water, and to treat it to levels acceptable to DEP and the EPA, before being discharged into the Susquehanna River.

The use, treatment, and/or reuse of hydraulic fracturing water as a result of the natural gas extraction process in Pennsylvania, is a major source of concern and interest to the citizens of the Commonwealth.

### **Wednesday, September 22**

- **Putnam 77 (2871 Fallbrook Road)**

This was the location of an active hydraulic fracturing operation for a Marcellus Shale natural gas development site. This is located on private property, and is being developed by the Talisman Corporation. The pad site is monitored for visitors, and personal safety is emphasized – hard hats, safety glasses, ear plugs, solid boots, etc.

- **DCNR Well Site 587 02-008 (2283 River Road)**

This drill site, on DCNR-managed lands, presently contains four Marcellus Shale natural gas wells. The rig on this site is a “walking” rig that can move itself from one drill site to another on the same drill pad. Besides the drill pad site and the drilling activity occurring there, discussions also focused on the adjacent water impoundment. Water stored here serves as a freshwater source for hydraulic fracturing operations.

- **Ridge Road, Ward Township**

This road is being used as a corridor for industrial development vehicles, local traffic, and pipeline construction. The pipelines are being located primarily within the road’s right-of-way and are conveying fresh water to freshwater impoundment areas, as well as some Hydraulic fracturing water for re-use in other drilling locations.

Wetland borings for the pipelines have been used under wetland areas as a way of minimizing damage, or as a way of avoiding, wetlands.

- **Water Withdrawal Site (687 Fellows Creek Road)**

An automated water withdrawal system is located here. This system, approved by DEP, allows for water withdrawals from Fellows Creek for natural gas drilling when water levels are sufficient, automatically shutting off when water levels fall below minimal levels.

A new bridge has also been constructed at this location in order to accommodate heavier construction vehicles crossing the creek.

- **Compressor Station (374 Fellows Creek Road)**

A compressor station, used for conveying the natural gas drilled in this area, is located here. It is anticipated that, as drilling activity increases, additional compressor stations will be needed and either situated on this site, or in other areas.



# **2010 CAC/CNRAC Joint Informational Session Panel Discussion Summaries**

**[Please note that the perspectives and answers provided by the panelists in this report do not necessarily reflect the views of the advisory councils.]**

## **Natural Gas Development Informational Session Panel #1 - Overview with Talisman Representatives Wellsboro, Pennsylvania**

**September 21, 2010**

### **Talisman Representatives**

Tracy Gregory – Landman

Kyle Hegel – Environmental Protection Team Lead

Sheldon Lillico – Field Manager

Chris Lowman – Sr. Drilling Engineer

David Whedbee – Road Coordinator

Scott Tompkins – Senior Advisor, Stakeholder and Community Relations, Horseheads, NY

Betsy Mallison – Senior Advisor, Stakeholder and Community Relations, Pittsburgh, PA

Marty Memory – Water Usage Engineer

### **Sheldon Lillico - Overview**

Talisman has operated in the New York area since 2001. Effective January 2010, Fortuna Energy, which was a subsidiary of Talisman, changed its name to Talisman Energy USA, Inc. They are the largest producer in New York of the Trenton/Black River conventional gas play. Talisman has a legacy land position with stakeholder relations and they know about the many functional groups and landowners in the area.

The corporate head office is in Pittsburgh, where they oversee all U.S. operations. Formerly, the head office was in Horseheads, New York. Horseheads is now a field office with a staff of 75-80 persons for the entire area looking after their operations. Talisman also has a field office in Houston, Texas, overseeing shale development there.

The life span of operations includes the development phase, pilot and asset development planning, and the operations phase. Currently in the Marcellus Shale, Talisman is in the asset development phase – planning how to strategically put in the wells, picking pad locations, gathering and trunk lines, so they can deplete the formation most effectively with the least footprint on the land.

The operations phase is next with a 1- to 50-year time scale. Once the wells have been drilled on the land mass they control, the full operations phase begins. After some years when they deplete the formation down, they'll look at optimization of the wells (about a 20-year prediction); no one knows how long the formation will produce.

The Marcellus Shale has very low permeability but lots of natural faults in it. To get the gas out requires locating the natural faults through seismic testing, and then using hydraulic fracturing to open the seams of the shale to release the gas. Using seismic data enhances their ability to maximize recovery of gas from the formation, and confidently map out pad locations and production infrastructure. In this area, the Marcellus Shale is about 200 feet thick. They drill vertically to the shale, then drill horizontally through the seam to get the best results.

### **Kyle Hegel - Health, Safety and Environment Policy**

Talisman has a corporate global health, safety, and environment policy, with safety being the number one priority. Environmental compliance and the minimization of the environmental impacts are core values of the company. These are communicated from top to bottom throughout the company. This policy underpins Talisman wherever they operate because, as a resource company, they understand that health, safety, and environment under-pins their license to operate.

Some of the issues that Talisman focuses on are water management and the amount of water used for the hydraulic fracturing operations; groundwater protection; surface impacts associated with horizontal pads; traffic management; and health, safety, and environment policy. Talisman conducts regular health, safety and environment meetings/workshops for all field staff and local contacts.

Another issue is keeping the hydrocarbons where they belong in the pipe to protect the environment and public safety. For all field staff in Pennsylvania, communication is key for laborers on up to the highest senior manager, with three key rules to follow: no one gets hurt; nothing gets spilled, and be a good neighbor.

### **Scott Tompkins and Betsy Mallison - “Good Neighbor” Program**

Talisman’s “good neighbor” program integrates the company into communities, pro-actively provides education and outreach to the community about the business, and resolves issues where there may be miscommunications. The company holds open house events, attends festivals and state fairs, and participates in community activities. The company also makes community contributions, often for the children. The company has received positive feedback for its efforts. The program also includes a “good neighbor hotline,” which is a 24-hour call center service where people can voice their concerns and viewpoints about issues regarding their land, etc. This has proven to be a very successful tool.

### **David Whedbee - Road Issues**

The industry is taking measures to reduce the impacts to the road systems. For example, the company builds fresh water impoundments to serve multiple pads; builds pipelines to transport water (reducing the need for trucks), and recycles hydro-fracturing flow back water for future hydraulic fracturing operations. Multiple wells on pads and horizontal drilling also helps to reduce the impact of multiple surface operations.

With regard to road repair, the company plans ahead of drilling activity and sometimes totally rebuilds roads to be able to handle and sustain the pending truck traffic. This year, Talisman has rebuilt nearly

60 miles of roads in Tioga and Bradford counties; about 10 percent of those miles are township roads and the rest are state roads.

### **Chris Lowman - Well Design**

Wells are designed to be drilled safely and efficiently. The wells are designed with 3 casing strings:

- The first is the surface string, which is the coal and water protective string. It isolates the well from the fresh water aquifer and from any coal layers that can be mined. Once the surface casing hole is drilled, the surface casing is placed within the entire depth of the hole. The surface casing is essentially a large heavy walled steel pipe. Once the surface casing is in place, cement is pumped under pressure into the area between the original hole and surface casing, from the bottom of the hole up to surface. Pressure pumping the cement ensures there is no space between the wall of the hole and the casing. Once the surface casing cement is set, it is tested for integrity.
- The next string protects the surface from the most shallow gas field. Blowout equipment is attached to this string.
- Finally, they drill the main well bore to penetrate the gas bearing formation. This hole is a smaller diameter that is drilled inside the surface casing. All drill cuttings and fluids are contained within the surface casing. "Production casing" is placed in the hole and spans the full length of the well bore from the deepest depth to the surface. Once again, cement is pumped in the area between the surface casing and production casing to seal and secure the production casing.

### **Marty Memory - Water Usage**

Well fracturing is not a new concept. They are drilling into a seam that is from 100 to 200 feet thick, with no permeability. The gas resides in void spaces which are not tied together so the gas cannot flow. High pressure water is used to break up that rock, and sand holds the fractures open when the pressure is reduced. Typically, a Marcellus well uses about 600 tractor trailer loads of water. About 20 percent of that water comes back as flow back water. Talisman recycles the flow back water, and has zero liquid discharge; even the water sent offsite for treatment comes back to be reused, not discharged into a Pennsylvania stream.

The area of Marcellus play is rich in surface water. The surface run-off, which eventually ends up in the Susquehanna River, the Chesapeake Bay, and ultimately the Atlantic Ocean, consists of about 26 billion gallons of water a day. Even while hydraulic fracturing 3,500 to 4,000 wells a year, gas drilling will use less than 50 million gallons of water a day in Pennsylvania as opposed to other states. In comparison with recreation use, golf courses consume more water.

### **Question and Answer Period**

*How does Talisman avoid and/or control spillage and leaks?* Talisman has a corporate philosophy of seeking continuous improvement. Every time Talisman builds a site, pad, or hydraulic fractures a well, they do it better than the one before. To prevent spillage, there are proper containers for anything that is

hazardous and needs to be stored. The entire site is then underlain with sand, 30 mil synthetic liners with felt on top. The liners are usually in use about six to eight months, but are made to last longer. Should tears occur, they can be repaired with a piece of the same plastic material sealed with a heat gun. There are regular inspections on these sites, and the liners receive close attention for any holes.

***Where do you send your water for treatment?*** In this area, they take water to the Terraqua facility for treatment, and treated water is returned to the next hydraulic fractured site. Terraqua is not a municipal water treatment facility, but is specifically designed and operated for treatment of hydraulic fracturing water.

***How do you ensure that the 80% of the hydraulic fracturing water that doesn't come back doesn't go through a fracture and enter the fresh groundwater?*** Hydraulic fracturing occurs well below any potable aquifer, and is segregated from fresh water by both solid rock and sometimes layers of saltwater.

***Do unplugged, abandoned and orphan wells present a pathway for hydraulic fracture water and gas to communicate with the surface and/or with potable groundwater?*** Fracturing only propagates fractures within 500 feet of the well bore, which is still well below any conventional wells that may be in the area.

***How do you deal with the lingering perception that drilling will harm water quality?*** The best way is through pre-drill water testing. This data can be used to show whether or not there have been any changes as a result of drilling and production activities. When there is a problem, they provide replacement water.

***Do you cooperate with other companies in developing pipeline rights-of-way?*** Different widths are required depending on different characteristics: pipe diameter; surface vs. underground; on forested areas vs. fields vs. along roads; etc. Companies try to purchase/lease rights in large blocks so that they are the only driller operating in that block. Multiple wells in that block are all served by the same infrastructure, minimizing surface impacts of gathering and transportation. When this is not the case, they work with other companies.

***What about Talisman's compliance record?*** They are second best in the PALTA study of violations in the industry, with an average of only 0.5 violations per well (90 Notice of Violations (NOVs) total), and have only had two spills to date (August 2010).

***Is Pennsylvania tougher or easier on drillers than other states and countries they operate in?*** For land based operations, Pennsylvania is one of the strictest. Talisman has company standards that are well above most state standards. It is easier for them to work in a clearly defined regulatory environment, as opposed to a state with loose oversight and requirements.

## **Overview of Gas Development in Tioga State Forest**

### **Roy Siefert – DCNR Tioga District Forester**

The mission of the Bureau of Forestry (BOF) is to protect environmental resources and to ensure that the citizens have a healthy, sustainable forest. With the drilling boom, these industrial sites are spreading across the landscape. As land managers, the Bureau is concerned with how wells are drilled, and with ensuring that they are located properly and proportionately.

### **Justin Shaffer – DCNR Tioga Forester**

Tioga State Forest consists of 162,000 acres, located primarily in Tioga County. Until recently, mineral extraction has been limited. In the Tioga State Forest, to date there are four lessees, 10 tracts, and just under 46,000 acres under lease agreement, with 40 wells drilled:

- The first lease in Tioga State Forest was in the western portion of the forest in 2007 with Ultra Resources. The state owns nearly 85% of the mineral rights in state forest lands. There are portions of state forest land where the state does not own subsurface rights; in this case, Ultra acquired these rights. Therefore, the BOF entered into a surface use agreement in order to control that development in the state forest. Some of Ultra's wells there will be producing very soon.
- In 2008, there was another large lease sale with Exxon Mobil; to date, there has been no activity on this land.
- Seneca Resources has two leases with the Commonwealth – the first lease was in 2008 and the second in 2010. On these lands, drilling is occurring and one well is producing.
- In 2008, there were 12,000 acres leased to Talisman Energy for subsurface rights. There are 25 wells being produced and directed into a pipeline from this acreage.

Much of the Blossburg area has been previously disturbed from strip and deep mining for coal. The Commonwealth is working with Talisman to place as much development on those pre-existing disturbed sites as possible, rather than disturbing the true hardwood forest. This area consists of 256 acres and has a mix of township and state forest roads, which makes it very accessible for development. When completed, there is expected to be roughly 18 well pads, 85-90 wells, and three fresh water impoundments, holding roughly 40 million gallons of water. Nearly 90% of the pipeline that has been built was placed adjacent to roadways. There is a compressor site and a few water withdrawal sites related to this development.

### **Question and Answer Period**

#### ***What is the level of impact of the nearly 17 miles of gated, state, township, or new roads?***

They have all been impacted. Talisman upgraded the gated state forest roads ahead of the development, in order to handle the traffic being generated by these activities. There were some issues on township roads, especially with the spring thaw, but they have also been upgraded.

***Of the 200 acres that were initially impacted, will parts be reclaimed and reforested after drilling and hydraulic fracturing are finished?***

Yes, that is definitely the plan once they are through the development stage. It will happen on a case-by-case basis. It will include planting and wildlife improvement upon the edges. There will be an opportunity to introduce coniferous species where they do not presently exist.

***Can you project how many well pads there will be when the four companies are finished with development on current leases?***

Based on seismic data, perhaps 150-200 well pads will be developed, multiplied by five or six for the number of wells drilled at each well pad. This will depend on how tight the rocks are; if there are not a lot of natural fractures in the shale, more pads may be required.

***What is being done regarding monitoring and inventorying for forest integrity and indicator species?***

Currently, foresters in each forest district administer their own leases and are on the ground watching the activity. Within all the forest districts that are Marcellus active, areas have been ecologically identified for monitoring. The lessee and the operators are asked to conduct monitoring. District foresters are required to visit each well pad at least once a week. A monitoring checklist is filled out each time by the district forester at each site. If there are any issues, the district forester addresses them to the company.

Looking ahead, DCNR has put together a conceptual plan for a monitoring program that would be administered by the Bureau of Forestry in a pseudo-research sense. Indicator species would become part of the monitoring function once it is created.

***Is your manpower adequate to handle the monitoring, along with all the usual day-to-day tasks?***

Manpower is adequate at the current level of development. As the remaining 30,000 acres are developed, more manpower will be needed.

***Is anyone looking for other funding sources?***

The Governor's Office approved creation of a Monitoring Section in the Bureau of Forestry by year end. This approval includes an increase of Forestry staff of 15 persons; funding would come from royalty revenue generated by this activity through the Oil and Gas Lease Fund.

***When siting gas wells, how are rare species handled?***

There is a lot of pre-planning before any activity begins on the ground. BOF requires lessees to run Pennsylvania Natural Diversity Index (PNDI) be generated to identify any endangered species of plants or animals. Even if there is no PNDI conflict, the lessees are still required to send a qualified individual around the proposed area of development to look it over and report any findings. The Bureau reviews the report, along with any PNDI information, and then determines if this area is acceptable for development or not. Forestry also has its own botanists and biologists that work closely on these sites.

**Natural Gas Development Informational Session**  
**Panel #2 - Overview from Local/Regional Representatives**  
**Impacts from Natural Gas Development**  
**Wellsboro, Pennsylvania**

**September 21, 2010**

**Panelists:**

Robert J. Blair – Tioga County Development Coordination President/CEO

Marvin Meteer – Wyalusing Township Supervisor, Bradford County

Leon Nouse – Ward Township Supervisor

Nels Taber – DEP North Central Regional Director

Jim Weaver – Pine Creek Watershed Council Chair

**Nels Taber – DEP North Central Regional Director**

The East Regional Oil and Gas Program for DEP (covering the eastern 44 counties) came into existence in April 2009, to address the rapid rise in drilling in north central and northeast Pennsylvania. Prior to that, all oil and gas exploration and permitting was handled out of the Meadville and Pittsburgh offices. To show the level of growth he quoted statistics regarding the drilling in this region.

- From 2000-2006 there were 44 wells in total drilled in Bradford, Lycoming, Susquehanna, and Tioga counties.
- In 2007, there were 13 wells drilled in those counties.
- In 2008, 67 of the 196 Marcellus wells drilled statewide were in those four counties.
- In 2009, 311 of the 763 Marcellus wells drilled statewide were in those four counties.
- In 2010, by August 31, 529 of the 902 Marcellus wells drilled statewide were in those four counties.

DEP's website has a webpage of maps showing on an annual basis the development of where shallow wells and Marcellus wells are being drilled.

Some of the early issues relating to this activity included:

- Chemical spills and releases resulting from sloppy handling and/or poor engineering and management practices. Corrective measures have been taken by the industry, such as Talisman adding liners to pad sites.
- Leakage in pits, due to poor construction techniques and poor management practices. At DEP's suggestion, instead of pits for flow back water, most of the industry now uses tanks. There are still issues, but not as many (e.g., plugs can fail or be vandalized, so appropriate security is needed).
- Erosion and sedimentation controls are one of the least areas of concern. Some early permit applications were substandard; companies must now go through the regular ESCGP-1 permitting process. There are more issues with E&S for pipeline construction.

Currently, an area of significant concern is stray gas migration. DEP is currently dealing with 10 confirmed cases, mostly in Bradford County.

- Some of these are historic cases, from abandoned/orphan wells; DEP continues to pursue plugging the abandoned wells through the Orphan Well Program. Homeowners are encouraged to have their water supply wells tested for methane and pre-methane constituents.
- Various layers of gas get trapped as you go deeper into the earth. In drilling through these layers, gas can migrate along casings unless blocked. Many companies have changed to three casings, which cuts off possible pathways for gas migration in shallow formations.
- Gas can be analyzed to identify its source (thermogenic (deep) vs. biogenic (shallow)). Isotopic analysis, or fingerprinting the gas, can help identify which well it may be from, but as it migrates through a formation, it can change its signature, or it may push another gas source through, so there may not be a perfect match. Not many laboratories are capable of doing this analysis.

DEP was understaffed with only 17 staff in a region now covering 44 counties. With the increase of the number of wells drilled, by mid-October there is to be an Oil and Gas staff of 50 people, with the possibility of a third round of hiring of inspectors, specialists, etc., if needed to meet with the growth of this development.

#### **Robert J. Blair – Tioga County Development Corporation (TCDC) President/CEO**

TCDC is a county-wide industrial development organization, which is involved in many facets of the community. Tioga County has a population of about 42,000 folks and is one of the top three counties in terms of land area.

There are seven gas extraction companies working in Tioga County. The drilling boom is impacting communities both negatively and positively.

One of the positive effects of recent natural gas development has been an increase in restaurant and lodging businesses. Tioga is heavily tourist oriented, creating competition for lodging between tourists and industry. There is a 3 percent room tax which benefits the tourist promotion agency. From 2008 to 2009 revenues from this tax increased by 24 percent; this is expected to increase again this year. Gas stations, shoe stores, tool supplies, support services and other small town businesses are also benefiting in these areas. New hotels are being constructed, as well. On the negative side, the increased competition has adversely impacted young couples looking for affordable housing.

Most of the natural gas companies are visiting school students informing them of the various job opportunities. For every well, there are 150 job classifications.

The major complaint is the influx of trucks. The industry is working with the various municipalities to figure out different routes, pay for signage, make road repairs, make better use of the rail system for importing sand, etc.

There has been an increase with student enrollment but not to the point where it's taxing the system; there is room for these students. However, the need for Spanish speaking interpreters could begin to affect that part of school budgets.



Instead of a severance tax, the TCDC would rather refer to it as an “impact tax,” which would be fairly distributed, including funds to DEP, DOT and local areas impacted by the drilling. This area has a lot of state land, and the “in lieu of tax” income is not sufficient. In addition, local government lost a lot of state funding at a time when they need more revenue to deal with the increased demand for social services and other impacts.

**Jim Weaver – Pine Creek Watershed Council (PCWC) Chair**

PCWC sprang from a river conservation plan that was developed in 2005 from a partnership between Endless Mountains RC & D, three county planning agencies, and conservation districts. Two councils of government (COGs) are involved with 25 townships, three boroughs, and four state forest districts in the 948-square mile watershed, with a population of 18,000, or 19 people per square mile. There are about 400 square miles in state forests and game lands in this region. There are about 31,000 acres of natural and wild areas, consisting of about 70% of the forested area. To date, about half of the watershed public lands are leased for Marcellus gas development, as well as most of the private lands.

This area does have legacy knowledge of the impacts of gas drilling, as historically, there were gas wells drilled in Gaines Township and there are still water quality issues from this past drilling. There is close watch of the gas development issues in the state forests primarily to protect the ecological integrity of the wild resources in the state forests.

With the Bureau of Forestry’s excellent GIS analysis of the potential impacts to the state forest system, the Commonwealth needs to take a close look at natural gas development on the state forests now, in order to protect the forest’s ecological integrity and wild nature. We need to ask why it has to all be drilled right now.

To balance these concerns, there are major investment areas in the Pine Creek Watershed with the “PA Wilds” and the Conservation Landscape Initiative (CLI) program. It is the largest inter-governmental cooperative agreement that has been done in the Commonwealth consisting of county planners and various stakeholders and partners. It is an important component of the way this region is viewed. The CLI program is a way to frame information from a conservation standpoint across a large landscape with five key elements – a sense of place, readiness to work with DCNR, partner engagement, strategic investments, and DCNR interest in investments. A major achievement stemming from this program was the national award DCNR received this year for the best state park system in the nation.

Some PCWC activities include working with the USGS on the eels and mussels project, enhancement projects, oral history, and a greenway connector of Pine Creek Trail to Wellsboro. An Issues Committee was created to deal with issues related to the rivers conservation plan, such as the Pine Creek Rail-trail and Chesapeake Bay watershed implementation plans. The Pine Creek Preservation Association and Trout Unlimited are historically active in the area, and very supportive of the activities of the watershed.

DEP and SRBC have both stepped up to the plate with regulation, inspection and policing of the industry, and have adapted and adjusted to the Marcellus issues.

**Marvin Meteer – Wyalusing Township Supervisor, Bradford County**

His township has had a challenging year. There are 10 operating rigs in Tioga County, 14 in Susquehanna County, 14 in Lycoming County, and 23 in Bradford County, indicating a lot of activity.

Last year, road issues were a primary concern. The roads in these areas were not built with this kind of heavy traffic in mind, but the gas companies have stepped up to the plate. Wyalusing Township has only one gas company to deal with, which simplifies this process, and the township has been very pleased with the company's response. Last year, the township was looking at repairing and replacing roads; this year they have reclaimed those roads through the Chesapeake Gas Company. This company rebuilt the roads very willingly according to the township's terms of long-term use. These newly rebuilt roads have handled a lot of traffic with no construction issues to date.

Pipeline companies and an oil field supply company are now located in the township. The rail system has become quite active, signifying an increase in business and local employment. Of Chesapeake's 1,100 employees, 400 are local residents. The challenge is that local businesses and the townships now have to compete with the higher wages of the industry when trying to fill jobs that were often vacated by people now working for the industry. Many of the industry's positions pay double of what the local positions do, which changes the picture for wages and salaries in the area. For the future, an asphalt company and water treatment facility will be built next spring, creating even more job opportunities.

An existing compressor station is being enlarged, with two additional compressors being built on the same site. A potential downside is that this may pose a security problem as a targeted area.

With all the pipelines and natural gas activity, this area is becoming the hub of the northeast. Gas prices for that area will be determined by that hub.

Reclamation of expanded stone quarries, pipeline rights-of-way and pad areas also looks to be a challenge in the future. Finding the time to address all issues the township faces is most challenging; the key is to stay on top of issues on a daily basis, and maintain good working relationships with the companies. This industry is still in the early stages of what appears to be one of the biggest energy opportunities in the world.

**Leon Nouse – Ward Township Supervisor**

Ward Township is a very small township consisting of only 127 families, with an extremely small township budget. There are no businesses located in the township. They were totally unprepared to deal with the drilling boom. Traffic has increased tremendously from 15-20 cars a day to hundreds. Traffic lights are even being considered.

Talisman Energy has been an excellent company to work with. They have been responsive to all requests presented to them. The biggest impact was to the township roads; last winter when vehicles were getting mired down during the breakup season, the company closed down their operations until all the township's roads were repaired according to the township's approval. Talisman supplied the township with equipment and materials to take care of other road areas as well.

Because of the small budget, most of the roads in the township are dirt roads, with only about three miles of road that is tar and chip. The township cannot afford tar and chip repairs to their roads.

Therefore, a stone base is replacing this portion, thus making it easier eventually to return that section to a dirt road.

Since the pipeline company buried the pipelines and re-vegetated the area, turkey, deer, and bear have returned, in more abundance than before.

Loggers used to shut down their operations until after the spring thaw/breakup season. Because of the constant traffic, roads are now posted year-round, resulting in more paperwork and costing more money for traditional seasonal users, such as loggers and farmers.

## **Question and Answer Period**

***Some townships do not have bonding requirements and even if they do, bonding amounts are grossly inadequate to what is needed to do regarding repairs. Can townships enter into maintenance agreements instead of posting the roads and requiring bonds?***

In Bradford County some townships that used to do posting and bonding now have maintenance agreements with the major users (including loggers) and it works very well. With logging companies, most of their work is so infrequent that with any damage done to roads is obvious. Similarly, damage from water trucks or drilling rigs is also obvious. Some maintenance agreements allocate responsibility based on actual damage, some just allocate a percentage to each user (e.g., the gas company takes responsibility for 90% of the damage and others involve take care of the 10%). There appears to be no problems with this approach.

***How many of the jobs are to be long-term? Were there studies done?***

Penn State Cooperative Extension has done studies in the Williamsport area. According to their reports, nearly 150 job classifications are associated with each well, with 410 employees for each well over the course of the whole development. For more information on this analysis, refer to Penn State's website.

The industry believes that most of these jobs will be sustainable. One job that would not be sustainable is the water truck drivers, as industry is looking to eliminate as much of this traffic as possible, and replace it with pipelines. They expect that there will be an 80% reduction in the number of water trucks in just a few years. Otherwise, many of industry employees will be able to retire from these jobs.

***Where is the water being obtained from?***

Most of the water comes from the Susquehanna River or its tributaries, with withdrawals governed by the Susquehanna River Basin Commission (SRBC). There are water withdrawal sights across the basin; there are also some municipal water supplies that have more water delivery capacity than they use.

SRBC requires an approval by rule for every gallon of water used in the basin for all the wells. Every gallon of water is tracked, regardless of where it comes from. The state does not have a regulation to regulate water withdrawal but there is a condition in each drilling permit that the companies cannot hydraulic fracture the wells until they have an approved water management plan from DEP. The companies also need to provide information on the source of their water and how they have come up with acceptable quantities. Within the Susquehanna Basin, the SRBC does a very thorough job of that review, so DEP has an agreement with SRBC that DEP won't approve the water management plan for companies until that source has received approval from the SRBC.

The Delaware River Basin Commission (DRBC) has regulatory authority in the Delaware River Basin. If the location is near the Ohio River, DEP will do a more thorough review since there is no river basin commission. DEP does not have a website reporting any withdrawals but the information could be obtained through file reviews.

As a point of comparison, all the water used for hydraulic fracturing is less than that consumed on golf courses and recreation areas. In some areas, companies are using acid mine water mixed with fresh water in hydraulic fracturing.

***Is there a state regulation that limits a company of water withdrawal for a well 10% of the average seven-day low flow of that watershed?***

Q (7-10) is the minimum seven-consecutive-day average flow which occurs at a statistical frequency of once in ten years. If a company requests more than this amount, the pass-by flow requirement comes into effect; if stream levels drop the company has to remove itself from the stream until it rises back up and is maintained for a 48-hour period. If you ask for less than Q (7-10), water can be still be taken.

***Are the drivers held accountable for damaging hoses and liners, resulting in spills?***

Yes, the drivers are held accountable. Engineering controls are put in place, and there are manifolds and conditions that are set where they can throw those hoses. In addition, there is a field supervisor overlooking the driving activity. Truck drivers can be dismissed for violations.

***Is there any real life data on the lifetime of steel casings or how long the cement will last?***

DCNR has gas storage wells that were drilled in the early 1950s and are still producing at depths beneath the Marcellus. These still meet the casing integrity standards, as well as cement standards of modern day. Some of those wells may have been reworked over time, improving the casings or cement.

Under DCNR leases, the 46,000 acres leased in Tioga County, have a series of bonds associated with them. Each of the lease agreements are covered with a \$25,000 performance bond. In the event that someone defaults, the Commonwealth has the ability to draw against the bond to fix road damage or assist in well plugging measures. In addition, the average Marcellus well in Tioga County under a DCNR lease will require a \$100,000 plugging bond per well. Should an operator decide to vacate, DCNR can use this ever-green bonding to plug those wells without any additional cost to the tax payer. The ever-green bond is active for the life of the lease. If an operator sells or transfers that lease to another company, the new lessee is expected to adhere to the same terms. The lease also provides that every five years, DCNR can increase the bonding requirement to align with the rate of inflation.

There is the potential that future generations may have to revisit some of these old wells and re-plug them appropriately at their cost.

***How do you verify that the concrete has been cured?***

In the lease agreement there is a series of standards that the operators are required to adhere to, particularly when they case or cement a well. Operations cannot begin for 24 hours after that cement has been set. Companies are required to provide to DCNR well and inspection reports upon their request. There are also tools (e.g., echo meters) that can be run to verify whether there is cement behind pipe in a particular location.

## Identified Issues of Concern

As a result of conversations with industry representatives, agency staff, and panelists, the advisory councils compiled a short list of issues that rose to the top of items of interest and areas that the CAC and CNRAC will want to continue to evaluate over time. These issues include:

- Bonding - DCNR's lease provisions are protective of activity on BOF lands, but the legal requirement as currently required under the Oil and Gas Act (as opposed to DCNR's contractual requirement) is clearly inadequate and needs to be updated.
- Water wells
  - Presumption of liability - DEP needs to evaluate the validity/adequacy of the 1000 foot presumption of liability in the Oil and Gas Law.
  - Water well testing - DEP is creating a list of analytical parameters for water well testing so that homeowners know what to test for and what it will cost.
  - CAC continues to advocate for passage of water well construction standards as one means to reduce the impacts of gas migration on homeowner's water supplies.
- Sufficiency of staff - both agencies need to regularly evaluate the sufficiency of staff needed to properly manage Marcellus Shale development.
- Forest integrity and monitoring - some entity (presumably BOF) needs to continue to monitor the impact of Marcellus development on the integrity of the state forest resource. The state forest has been certified for sustainability, which could be negatively impacted by the scope of this development.
- Gas development infrastructure (e.g., gathering and transmission lines, water impoundments, compressor stations, etc.) - Companies should be encouraged to pursue a comprehensive local and regional coordinated approach to the development of this resource. This includes coordination of efforts to minimize forest fragmentation concerns, pursue co-location and/or sharing of infrastructure such as pipelines, compressor stations, roads and water impoundments.
- Severance tax - The debate continues over the pros and cons of imposing a severance tax on natural gas drilling. Regardless of when such a tax is imposed, and in what form, both councils recommend that a significant portion of the proceeds be dedicated to land, water and wildlife conservation and to local governments impacted by gas exploitation, particularly Marcellus gas extraction. This can offset the damages caused by natural gas operations and avoid repeating the history of creating environmental scars and financial burdens for future generations. We have an extraordinary opportunity to invest in our natural resources and communities so that Pennsylvanians can prosper both during extraction activities and after the gas is gone, but we need to ensure these funds remain dedicated to the intended purpose, not raided for other shortfalls as has happened repeatedly to other environmental funding streams.

- Unplugged wells
  - Can seismic testing locate abandoned, orphan, unplugged wells, and can drilling? Companies should be encouraged or required to locate and plug orphan and abandoned wells in their area of activity (similar to encouraging re-mining and reclamation).
  - DEP's orphan well plugging program needs to be adequately funded.

The Marcellus Play is an enormous opportunity if developed responsibly. It has the potential to be disastrous, if not. Companies must do their absolute best to avoid/minimize impacts. Companies need to work together to ensure the best environmental outcomes.





## MISSION STATEMENT OF THE CITIZENS ADVISORY COUNCIL

It is the mission of the Citizens Advisory Council to strive to ensure that all people of the Commonwealth enjoy the benefits included in Article I, Section 27 of the Pennsylvania Constitution.

This mission specifically states that the Council is to carry out the mandates of Act 275 of 1971 and Act 95 of 1992, by:

- *Performing non-partisan, independent oversight of the operations, management and policy of the Department of Environmental Protection;*
- *Evaluating environmental issues and laws;*
- *Participating in the development of environmental regulations; and*
- *Providing advice concerning environmental matters to the Department, the Governor, the General Assembly, and the Commonwealth's federal representatives.*

The council strives to represent all people of the Commonwealth and endeavors to bring a collective view of the public interest in environmental protection and natural resources, forged from the Council's own diversity of personal experiences and perspectives.

(Unanimously Adopted: November 20, 1989; Amended: November 12, 1996;  
Reaffirmed: March 15, 2005; Amended: April 17, 2007)

### REQUEST FOR INFORMATION

If after reading this report you would like to receive more information about the Council *or* would like to be added to our electronic mailing list, please contact us at:

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**MISSION STATEMENT OF  
The Conservation and Natural Resources Advisory Council**

*Drawing upon the diversity of experiences and perspectives of its appointed citizen members, the Council will provide to the Department of Conservation and Natural Resources, to the Governor, to the General Assembly, and to the public, advice regarding the conservation and stewardship of the Commonwealth's natural resources.*

*The powers and duties of the Council will be carried out as legislatively mandated in Section 315 (d), Act 18 of 1995.*



**REQUEST FOR INFORMATION**

If after reading this report you would like to receive more information about the Council or would like to be added to our electronic mailing list, please contact us at:

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[jdupes@state.pa.us](mailto:jdupes@state.pa.us)  
**Web site:** [www.dcnr.state.pa.us/cnrac/](http://www.dcnr.state.pa.us/cnrac/)

**Pennsylvania Constitution**  
**Article I, Section 27**

*The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustees of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.*



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