

Regulatory & Technical Issues in the Marcellus

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Topics of the Day

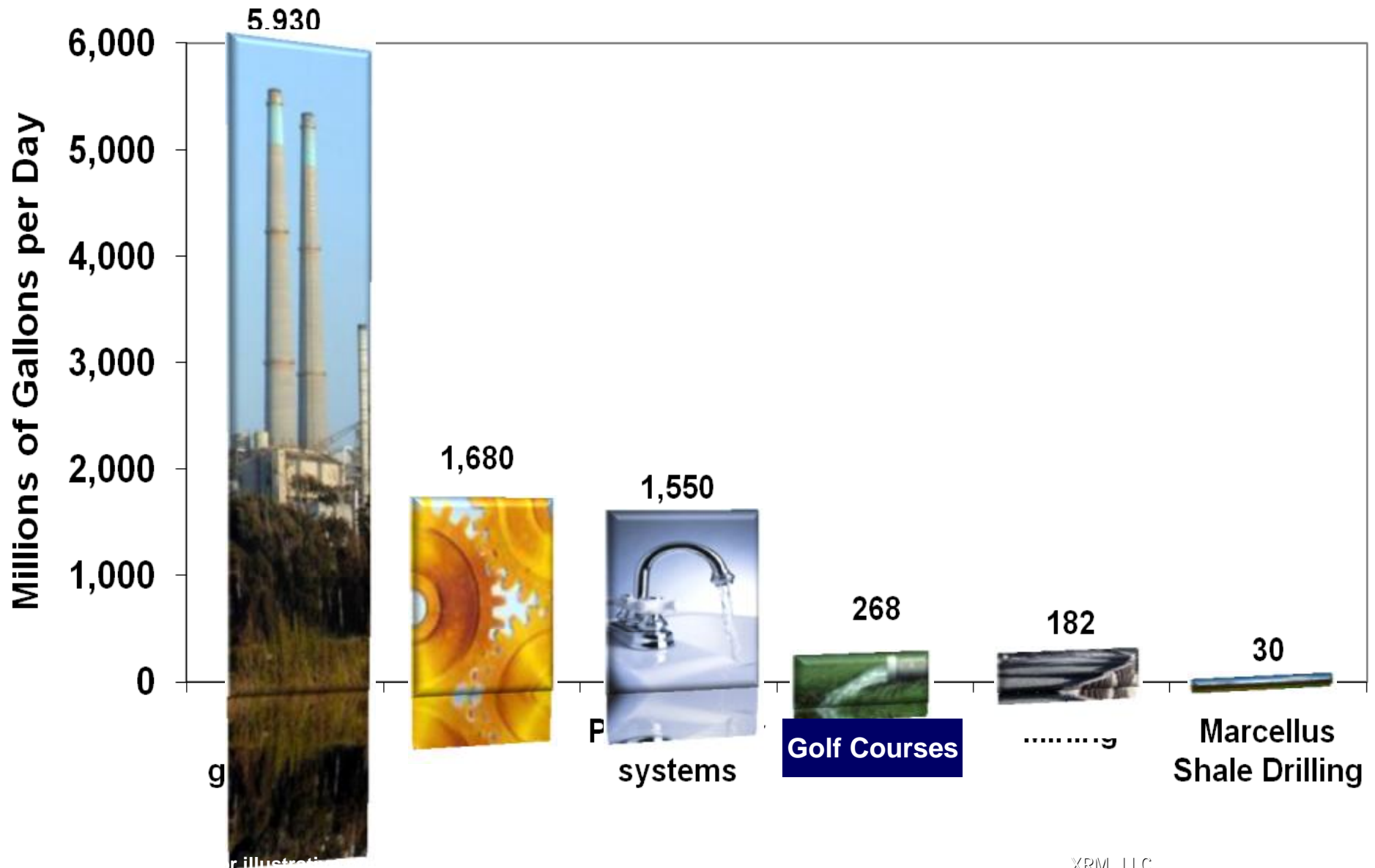
- n Water supply issues, watersheds
- n Hydrofracing and fluid migration
- n Wastewater treatment and disposal options
- n Public confidence in Division of Mineral Resources

Water Supply



- n A manageable resource, low water use vs. other industries
- n DRBC, SRBC involvement
- n Now DEC proposing water supply regulation
- n Million gallons per frac segment
- n Transport issues

Comparable Water Usage in PA



Susquehanna River Basin Comission

- n Federal interstate agencies regulate water withdrawal from basins
- n Regulates any amount of water use for Marcellus - 2008, 2009
- n SRBC issuing permits after review, approval by rule
- n Complementary to state processes

Delaware River Basin Commission

- n Eliminated thresholds for gas extraction projects
- n Includes drilling pad, facilities, withdrawals
- n Approval by DRBC for any wells
- n Developing rule-making (redundant to state regulation?)

NY's Oil and Gas Regulatory Program

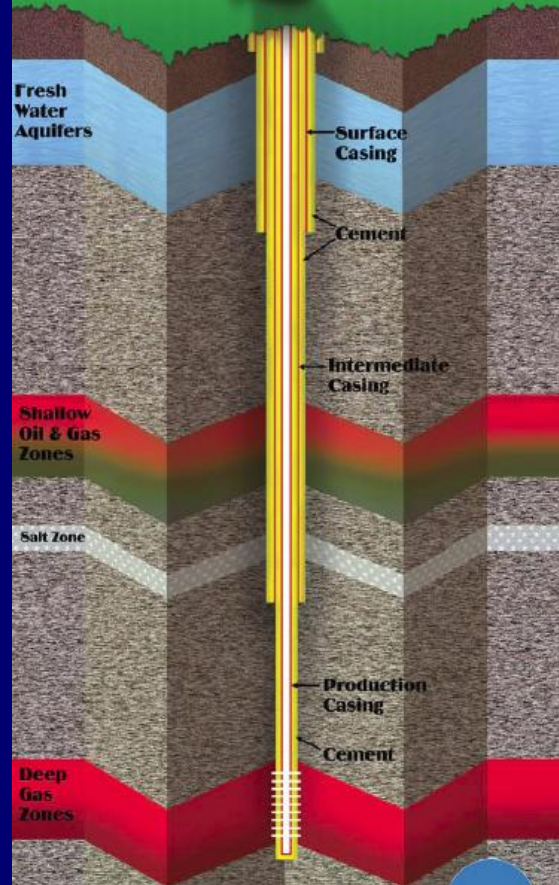
- n Modernized by 1981 Amendments
- n Developed as a groundwater protection program
- n All wells are cased and cemented through freshwater zones since early 80's
- n Cementing of any well drilled in primary aquifer is witnessed by DEC

Groundwater Protection

Well Casing and Cementing Program

The Division of Mineral Resources' well casing and cementing regulations provide for the protection of the State's fresh water aquifers

Regulations require that wells be constructed and operated to prevent the movement of oil, gas or water from one zone to another



New York State Department
of Environmental Conservation

XRM, LLC



Hydrofracturing and Water Use

- n Fracturing fluid mostly water and sand, less than 1% additives
- n 10% to 30% of the fracture fluid flowback to tanks required by SGEIS
- n Multiple fracs (3-4+) on each horizontal well
- n Flowback includes metals, salt water

Common Additives

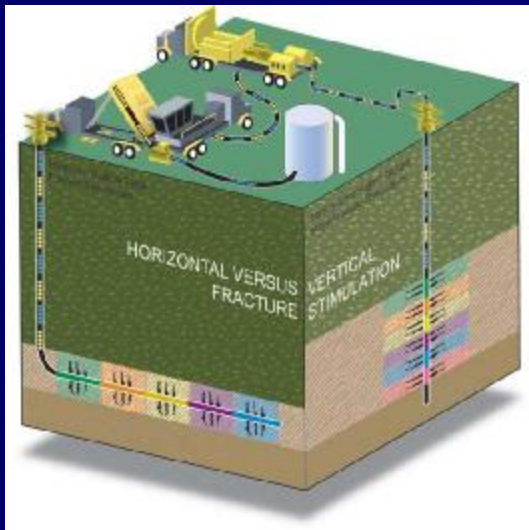


- n Surfactants
- n Biocides
- n Scale inhibitors
- n Friction reducers
- n Proppants

Hydraulic Fracturing

- n First hydraulic fracturing (granite mining) 1903
- n First oil and gas frac 1948
- n First commercial oil and gas frac 1949
- n Medina sandstone (NYS) 1960s
- n First horizontal well frac (Barnett) 1995
- n All Barnett wells fracked: over 11,000!

Hydrofracing Experience

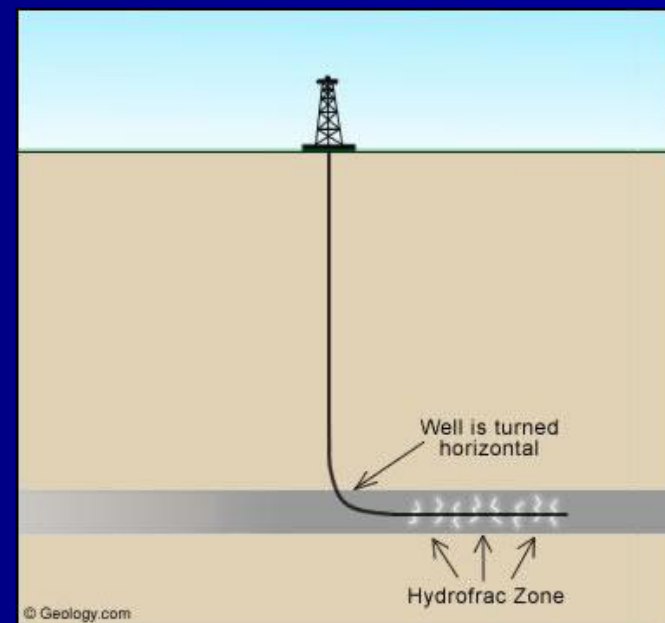
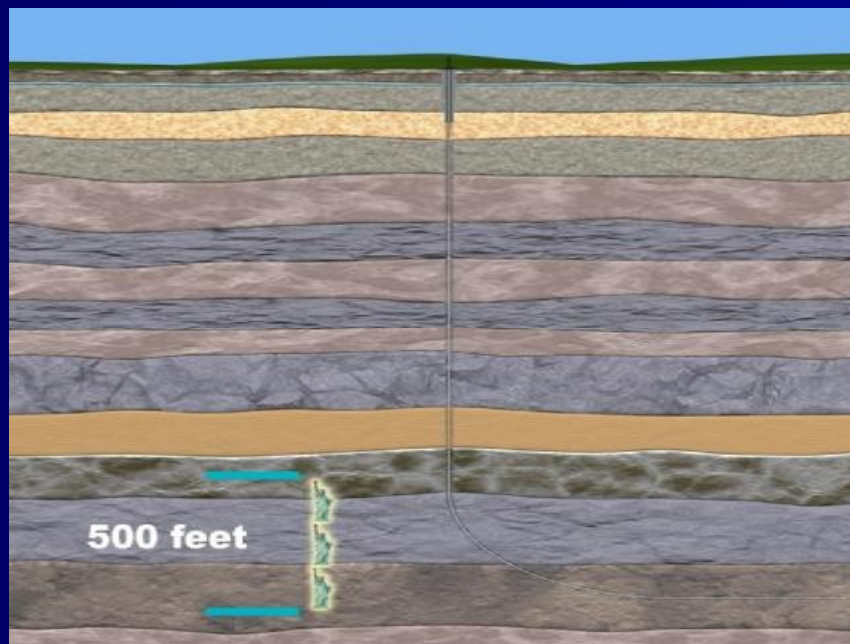


- n More than 1 million wells hydrofraced since 1940
- n Governmental organizations never raised any issues
- n Nothing new in Marcellus hydrofrac except more water and chemicals

Therefore, the injected fluid does not come into contact with groundwater; it is, in fact, injected into and recovered through a wellbore that has been specifically constructed to safely convey hydrocarbons under pressure to the surface without negatively impacting fresh water aquifers. The Department has ***no record of any documented instance of groundwater contamination caused by hydraulic fracturing for gas well development in New York, despite the use of this technology in thousands of wells across the state during the past 50 or more years.***

New York State Department of Environmental Conservation
Division of Mineral Resources
Bureau of Oil and Gas Regulation

Horizontal Drilling and Hydrofracturing



Safe Drinking Water Act - 1974

- n No exemption for hydrofracing
- n Never intended to be regulated by feds
- n Hydrofracing is not waste disposal
- n Deep well disposal common
- n What would feds regulate that wasn't already regulated at the state level?

EPA Jumps In

EPA Starts Hydrofracking Study

By: Clean Skies News, Published: 03/18/10 4:08pm



The EPA says it will redirect nearly \$2 million to get a study on hydraulic fracturing under way this year.

The study comes amid increasing fears that hydrofracking could contaminate drinking water aquifers. The practice is now regulated state by state.

EPA says the study will be transparent and peer-reviewed, and is asking its independent

Science Advisory Board to help frame it. Administrator Lisa Jackson said last month the agency would need another \$30 million to complete the study.

EPA Study: \$30 Million?

- n 1974 - hydrofracing never considered for Safe Drinking Water Act
- n 2002-2004 EPA concludes hydrofracing no problem
- n IOGCC concludes hydrofracing no problem
- n EPA official: states doing good job

EPA Study Conclusions?

- n Circus-like hearings held around country
- n EPA looking for more money, time
- n Will not find any widespread impacts
- n Disclosure of chemicals will save face
- n Major waste of money, time: political football, NYS moratoria?

Produced Water Treatment Options

- n Economically viable options primarily distillation/evaporation or reverse osmosis systems
- n Both processes have limitations, could be expensive
- n Both produce a high concentration solid that requires disposal

Reuse & Recycling

- n Movement toward recycling of produced water, onsite
- n Reduces transport costs
- n Driven by current and future regulatory limits
- n Lessens pressure on treatment plants
- n Research needed on beneficial uses

Disposal Options

- n Sewage treatment plant
- n Landfill for solids
- n Distillation and reverse osmosis plants
- n Deep well disposal
- n Hazardous waste facilities



Lake Country FracWater Specialists, LLC

- n Remove barium and strontium chlorides, other metals
- n More efficient reuse, prevents scaling
- n Mobile unit on site
- n Saves truck traffic
- n Produces inert, beneficial use compounds



Defending a Near Perfect Record

- n No impact to groundwater from drilling
- n No impact on aquifers from drilling
- n No impact to groundwater from hydrofracing
- n No lawsuit on any well drilled since 1984
- n Yet Marcellus development stalled!

Division of Mineral Resources

- n Smallest division in the NYSDEC
- n Highly professional staff
- n Mandate to protect environment and correlative rights of landowners
- n Two major regulatory programs – MLRL and OGSML
- n But continually fighting misinformation

Albany Times Union Front Page – July 2008

MORE NEWS

STUDENT LOANS Governor backs low-cost aid

Gov. David Paterson says he supports a state commission's proposal to give hundreds of thousands of students access to low-cost loans. /A3

PAY RAISES Albany council seeks oversight

Common Council members back plan that would give them more power over midyear raises and reorganizations. /A8

LATEST LOCAL NEWS

WATER LINE Judge OKs use of eminent domain

Saratoga County Water Authority receives court's approval to take land needed to construct a 26-mile, \$87 million water line. /D1

LIFE • HEALTH A quick fix for baby's 'tongue-tie'

A relatively easy medical procedure was the answer when doctors found an anomaly that kept Jake's tongue from working right. /E1

BUSINESS

Toxic gas-drilling technique

"Hydrofracking" plan raises questions about water safety in state

By ABRAHM LUSTGARTEN
ProPublica
Special to the Times Union

In May, top state environmental officials told lawmakers that plans to drill one of the richest natural gas reserves in the United States posed little danger to the air or the watershed that feeds drinking water to New York City.

With energy prices at record highs, a growing number of diffi-

EXCLUSIVE

cult-to-reach deposits of oil and gas in the U.S. are becoming commercially viable. At least nine companies are pursuing drilling rights in New York, Pennsylvania and the southern Appalachian states to the Marcellus Shale, a rock layer that some geologists predict could meet the nation's natural gas needs for more than two years.

A survey of other states had found "not one instance of drinking water contamination" from the kind of drilling that would happen in New York, the officials said.

Reassured, the Legislature approved a bill to streamline the permitting process for the wells, which could bring the state upwards of \$1 billion in annual revenue. Gov. David Paterson has only until Wednesday to sign the bill. The Department of Environmental Conservation says drilling permits could be approved in as little as 12 weeks.

But the bigger picture of this drilling technique, called "hydrofracking," is not pretty.

The gas in the Marcellus is held like bubbles in a brick of Swiss cheese. To extract it, a mixture of
Please see FRACTURING A6 ▶



LORI ZUNNO/PROPUBLICA

SCIENTISTS fear small water sources, such as this wetland in Oxford, Chenango County, will be tapped to support drilling.

VALLEYCATS



UAlbany student detained in Iran

Fate of noted AIDS expert Kamiar Alaei and his brother is unknown

By MARC PARRY
Staff writer

ALBANY — A University at Albany public health student internationally known for his AIDS work has been arrested by Iranian

The Debate Clash

Technical, scientific

- n Oil and gas industry has answers
- n Done safely everywhere
- n Significant economic development, jobs
- n Production of clean-burning natural gas

Social, philosophical

- n No drilling is good
- n Hydrofracing lightning rod
- n Hate oil and gas industry
- n Know don't like it, but can't find substantive technical reason
- n Exploitation of Mother Earth, natural resources

Division Needs Help

- n Will become major bottleneck
- n DEC lost 260 staff to early retirement
- n Now additional 209 cuts by 12/31/10
- n Institutional memory – ancillary programs
- n Without staff, subject to criticism
- n Public confidence needed

What is at Stake?

n Energy

- Domestic supplies near markets
- Balance of payments, national security
- NYS Energy Plan

n Economic development

- Significant impact to state, localities
- New jobs, new industries
- Landowners share wealth

Counties, Towns, Landowners need Closure

- n SGEIS needs to be finalized
- n Need to capture investment in NY
- n Development taking place in depressed areas of the state
- n Landowners desperate for cash
- n Keep farms as farms, open space

Environment

- n No compromises
 - Protection of fresh waters
 - Stringent state regulatory controls
 - Water management plans
- n Advances in drilling technology
 - Smaller footprint
 - Greater resource recovery
 - Multiple wells from same pad

Marcellus Natural Gas Development

----- May be the greatest economic development opportunity in depressed areas of the state that we will see in our generation -----

- n No environmental compromises
- n Produce clean-burning natural gas
- n NY landowners deserve to share in the wealth, particularly in depressed areas

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Twin Tiers Landowners Coalition

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References

- n Twin Tiers Landowners Coalition - www.twintlc.com , see News page
- n Energy In Depth – www.energyindepth.org
- n Marcellus Shale Coalition – www.marcelluscoalition.org
- n American Natural Gas Alliance – www.angas.us