



Large drainage units: Achieving the Objectives of the Interstate Oil & Gas Compact Commission in the Post-Sinclair era of Horizontal Drilling

Recommended by Terry Engelder
to

The Economic and Workforce Development
Subcommittee
(Marcellus Shale Advisory Commission)



Acknowledgments:



Michael Reese, Law Student, Beasley School of Law

Brigid Landy, Law Student, Beasley School of Law

***Compulsory Pooling in Pennsylvania:
Getting to 'Yes' Proposal for Statutory Approach***



PENN STATE LAW

Anna M Clovis, Research Assistant, The Dickinson School of Law

Ross H. Pifer, Clinical Professor, The Dickinson School of Law

***The Pennsylvania Oil and Gas Conservation Law:
A Summary of the Statutory Provisions 58 P.S. §§ 401-419***





John K. Baillie, Senior Attorney, Penn Future

Pooling and Unitization in Pennsylvania

Thursday, June 16, 2011

Ridge: Gas industry must improve public image

By: MICHAEL RUBINKAM 06/16/11 2:39 PM

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Associated Press

Former Pennsylvania Gov. Tom Ridge, now a consultant to the natural gas industry, said Thursday that drillers operating in the Marcellus Shale recognize they need to improve their image if they want to be "warmly embraced" by the public, not just "grudgingly accepted."

Ridge toured several shale outcroppings with a Penn State University geologist, seeking to learn more about the gas-bearing rock that's led to a drilling



AP PHOTO/RALPH WILSON

Dr. Terry Engelder, Professor of Geology at Penn State University, left, is assisted by Susan Oliver while showing former Pennsylvania Governor Tom Ridge a chart explaining the Marcellus shale formation while touring outcroppings near Williamsport, Pa. on Thursday, June 16, 2011.

A geologist sleeps in the mud one night; the next night he/she puts on a tux and describes what he/she discovered in that mud!

All but One of the Major Natural Gas Producing States have Pooling Statutes

State (Gas Shale/Tight Sandstone)

WHY?

Texas (*Barnett, Eagle Ford Shales*)

Louisiana (*Haynesville Shale*)

Oklahoma (*Woodford Shale*)

Arkansas (*Fayetteville Shale*)

Colorado (*Mesa Verde Sand*)

Wyoming (*Green River Sand*)

WV, OH, VA, KY, etc.

IT'S KANSAS, TOTO!



Why? Pooling Statutes:

1. Maximize Economic Benefit
2. Minimize Wasteful Stranded Gas
3. Minimize Environmental Footprint
4. Provide Just and Fair Compensation

All private property would contribute to the greater public good while providing each and every land owner with just and fair compensation.



*Late 19th Century Industry
without a Compact (1868)*

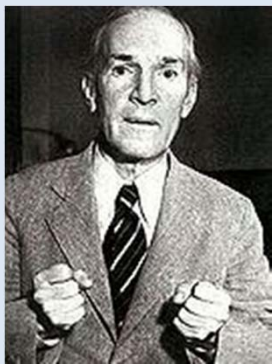
*Maximizes Environmental Damage
Maximizes Waste
Minimizes Economic Benefit
No Compensation*

EMPIRE WELL
FRANKVILLE
1863

Early 20th Century Industry without a Compact

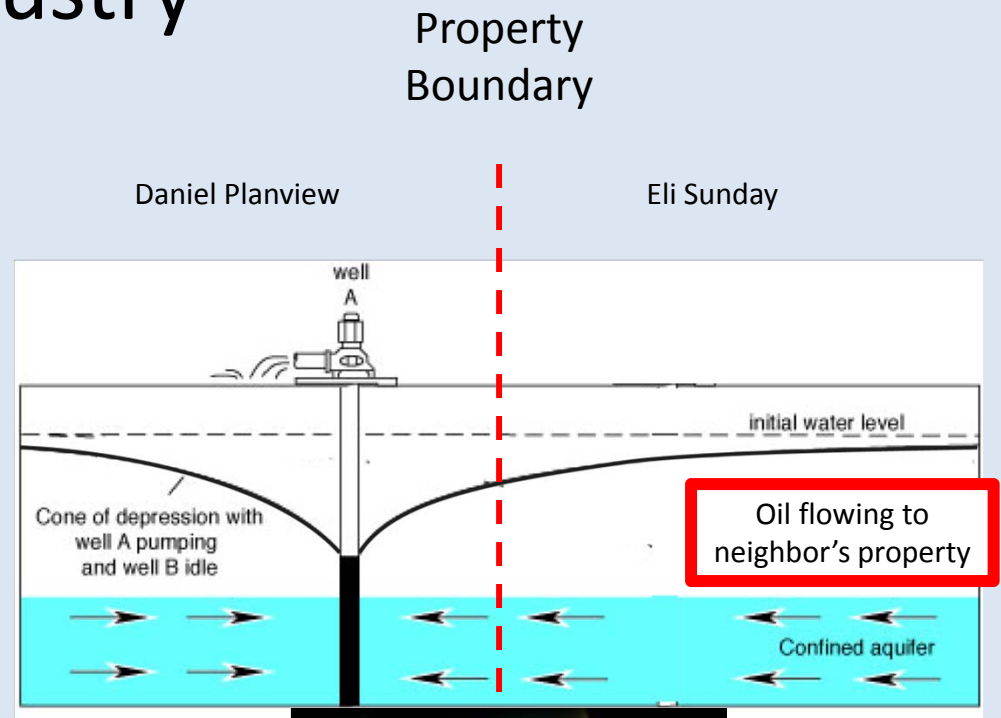
- **Conventional Vertical Oil Wells**: Production decreases formation pressure around well, thus causing flow toward the well.

- Seen as a cone of depression in water wells.



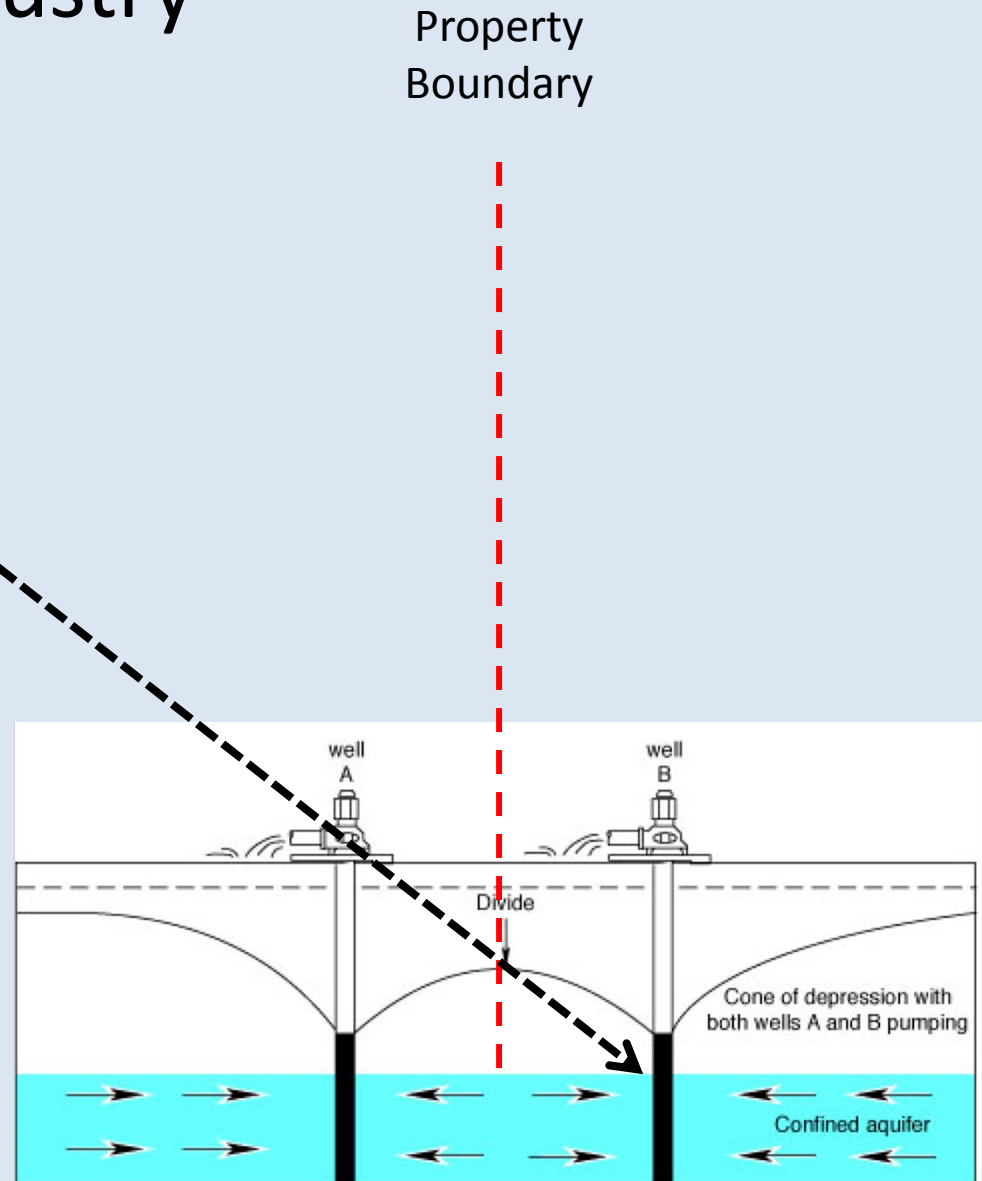
Upton Sinclair, 1927, Oil

Arguably the most influential champion for a compact



Early 20th Century Industry without a Compact

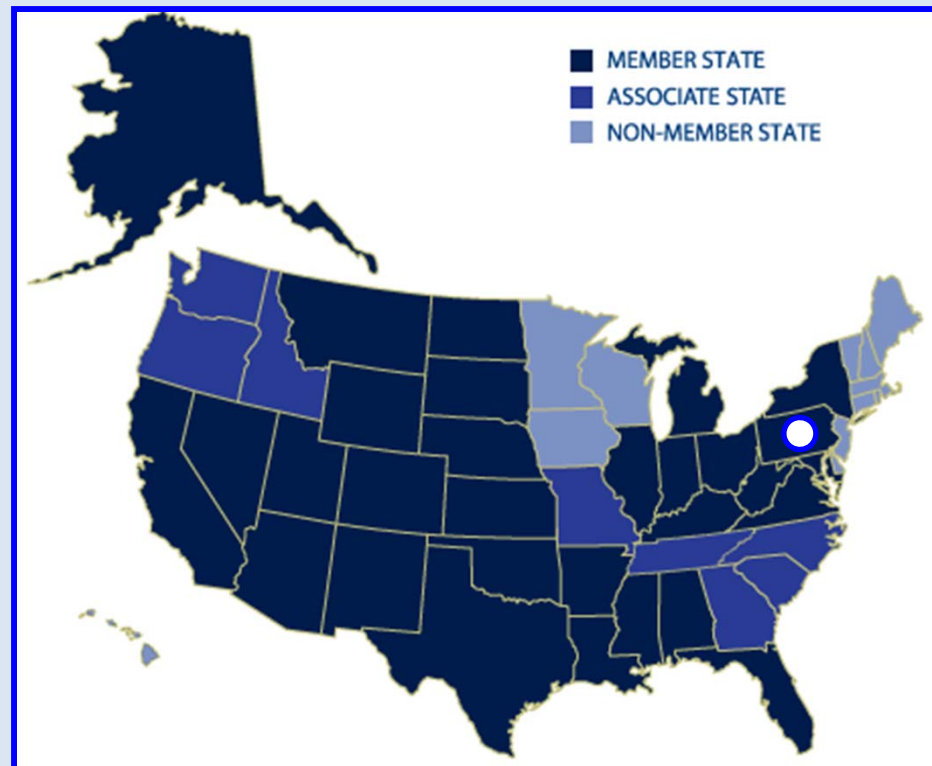
- **Conventional Vertical Oil Wells**: Only protection against loss was drilling offset wells.
 - **Offset wells** reduced pressure on reservoir, thereby reducing production and assuring maximum waste!





The Interstate Oil and Gas Compact Commission (1935)

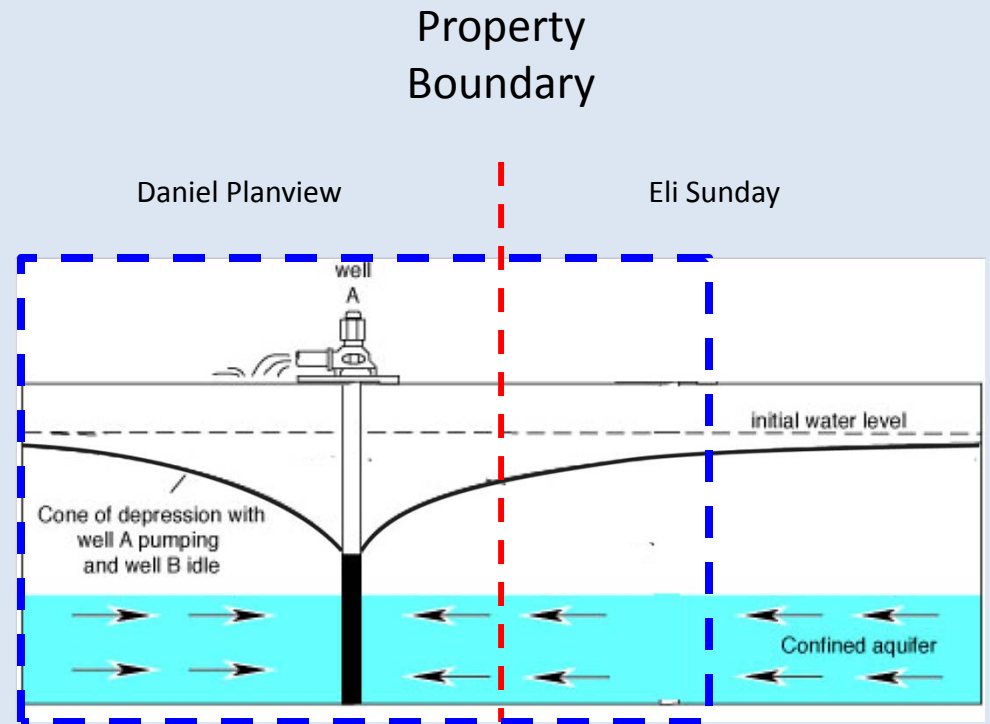
Commission mission: Ensure our nation's oil and natural gas resources are conserved and maximized while protecting health, safety and the environment.



*Pennsylvania
joined in
1941*



The Interstate Oil and Gas Compact Commission



Conservation Efforts:

Unitization of land (Daniel & Eli are one)

Spacing requirements (Daniel drills > 330 ft from Eli)

Pooling of interests (Royalties: Dan – 75%; Eli – 25%)

both see greater profit because pressure was managed appropriately

PA OIL AND GAS CONSERVATION LAW



Act 1961-359

What did PA legislators have in mind when framing the Conservation Law?

- *This Law makes it illegal to 'waste natural gas' in PA*
 - to foster, encourage, and promote the development, production, and utilization of the natural oil and gas.... in such manner as will encourage discovery, exploration, and development **without waste!**
 - to provide for the drilling, equipping, locating, spacing and operating of oil and gas wells so as to protect correlative rights and **prevent waste** of oil or gas or loss in the ultimate recovery thereof

PA OIL AND GAS CONSERVATION LAW



Act 1961-359

What did legislators have in mind when framing the Conservation Law?

- to regulate such operations so as to protect fully the rights of royalty owners and producers of oil and gas to the end that the people of the Commonwealth shall realize and enjoy the maximum benefit of these natural resources

The charge to the Marcellus Shale Advisory Commission is to assure this happens.

Conservation well

- A “conservation” well is defined as any well penetrating the top of the Onondaga Limestone (or equivalent formation when the Onondaga is absent) and is at least 3,800 feet deep.

Reports of high initial production (IP) as well



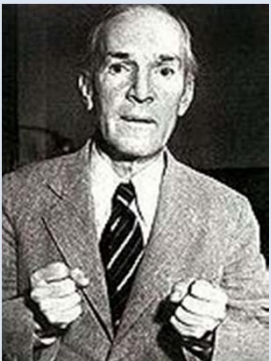
System	Western Pennsylvania	Northwestern New York	
Middle Devonian	Harrell Shale	Genesee Fm.	
	Tully Limestone	Tully Limestone	
	Mahantango Formation	Moscow Shale	Hamilton Group
		Ludlowville Shale	
		Skaneateles Shale	
	Marcellus Shale	Marcellus Shale Tioga ✓ bentonite	
Selinsgrove Limestone	Onondaga Limestone		
Lower Dev.	Needmore Shale	Bois Blanc Fm.	



Conservation Wells

*Act 1961-359 was written in
the Upton Sinclair era of
vertical drilling!*

*Are Sinclair-era conservation
laws relevant for the
horizontal drilling era?*

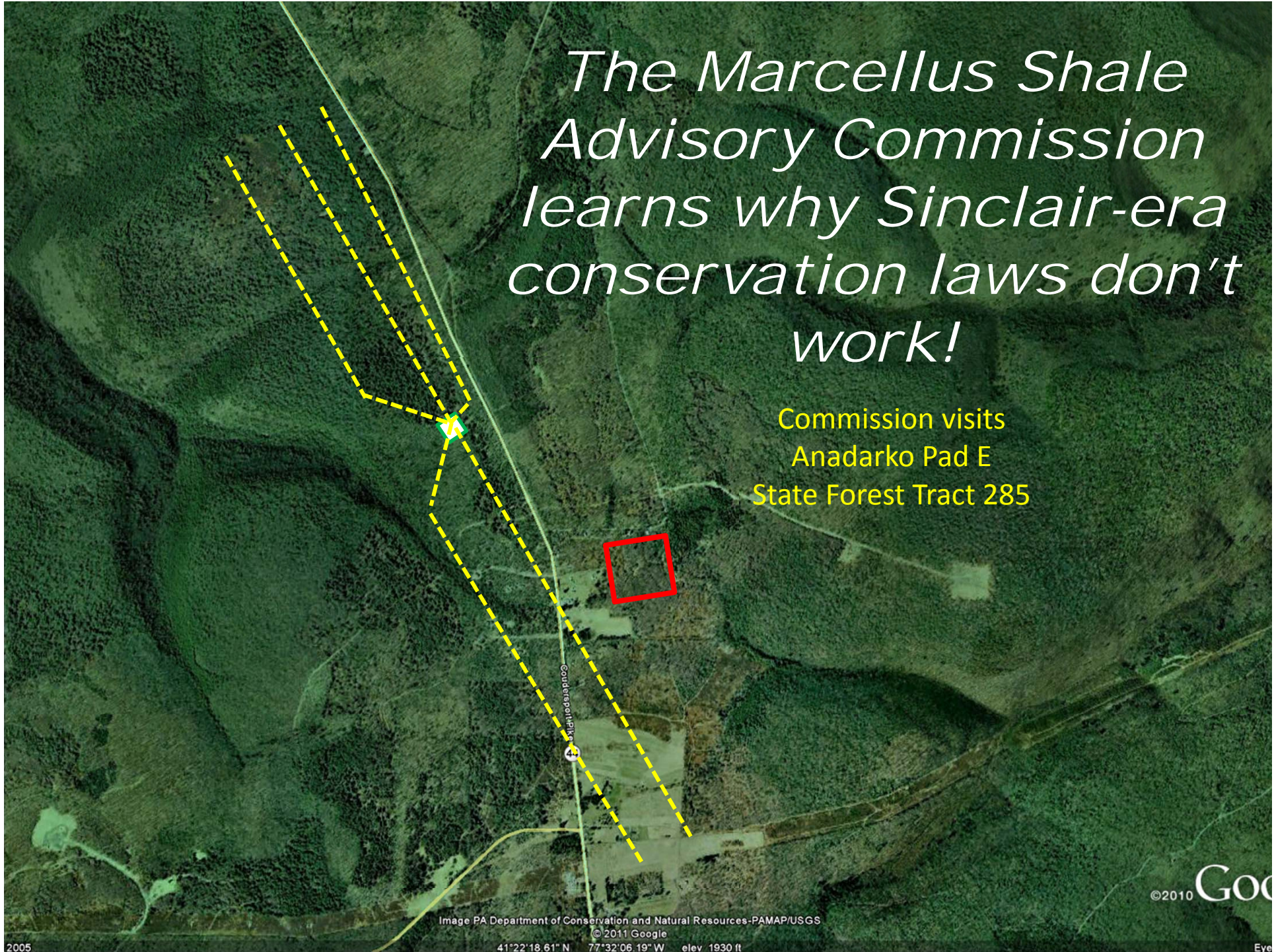


Upton Sinclair, 1927, Oil

Arguably the most influential champion for conservation laws

*The Marcellus Shale
Advisory Commission
learns why Sinclair-era
conservation laws don't
work!*

Commission visits
Anadarko Pad E
State Forest Tract 285



©2010 Google

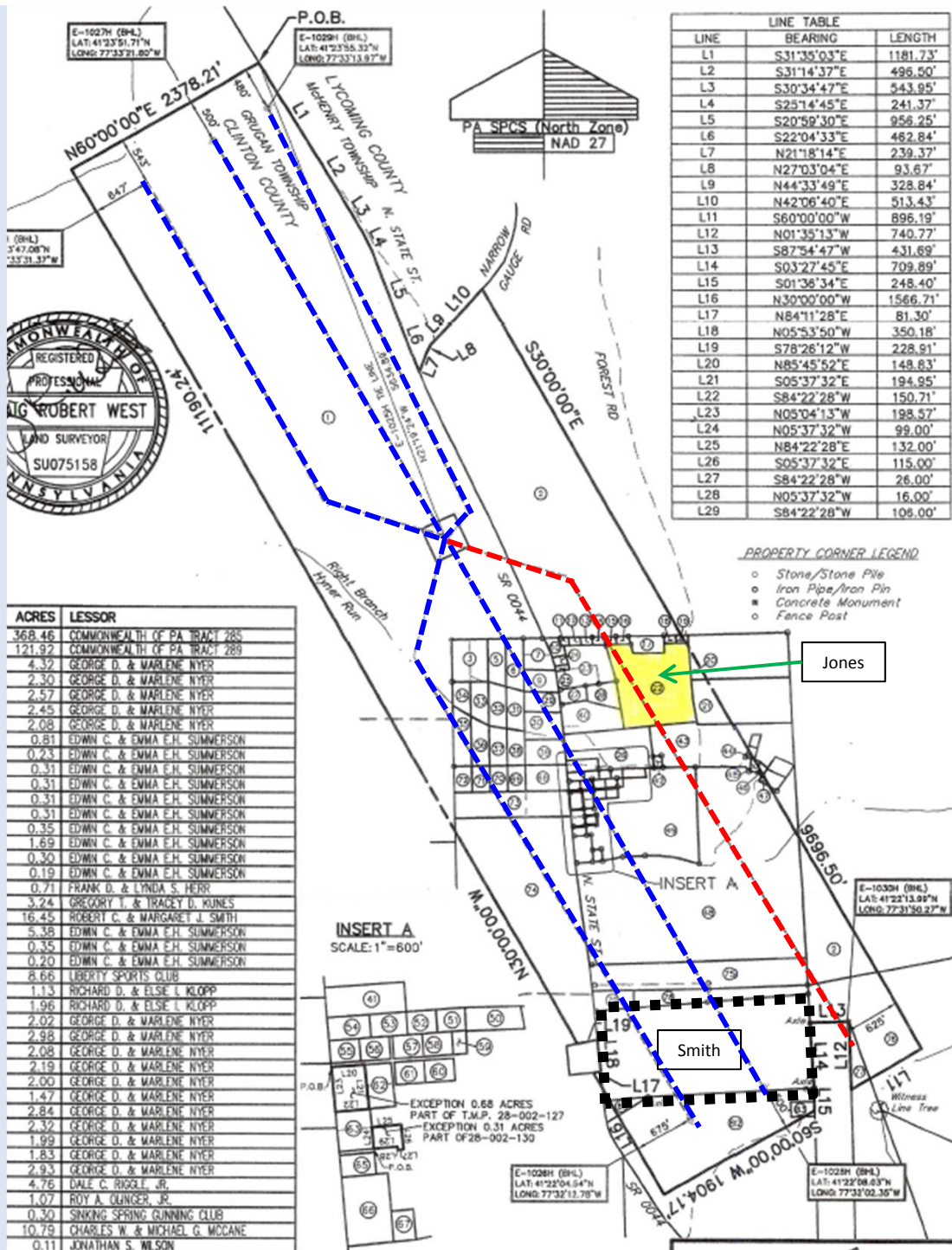
Image PA Department of Conservation and Natural Resources-PAMAP/USGS

© 2011 Google

41°22'18.61" N 77°32'06.19" W elev 1930 ft

2005

Eve



Anadarko Pad E
in
State Forest Tract 285
899.55 Acre Unit

-Anadarko obtains 82 leases
- Jones holdouts 22 acres
(2.4% of unit)

- One holdout means that
1 well in **6** is not drilled!
(16.7% of unit)
- One holdout potentially
costs the State's economy
5 Bcf of gas or more
Or
\$20,000,000 @ \$4/Mcf

- Jones holdout costs
Smith family over
\$200,000 in revenue
over lifetime of wells

Gas drilling can spark neighbor disputes

Decisions on leases divide residents

Sunday, May 29, 2011

By Erich Schwartzel, Pittsburgh Post-Gazette

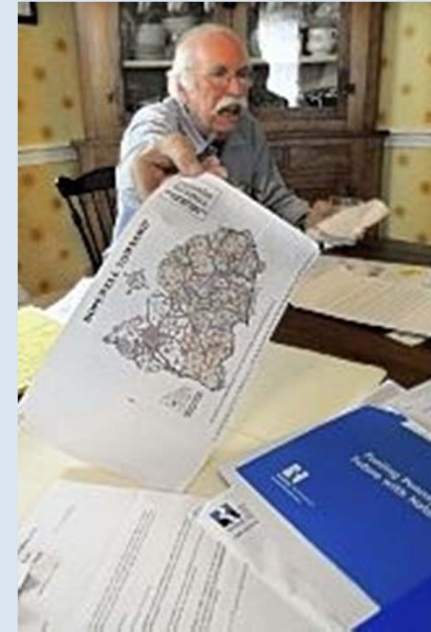
Mr. Parker's seven acres in Avella are "right in the middle, like the hole in the middle of a doughnut, "

"Well, that's how it's gonna be!" he said. "I'm gonna be the last man to sign. Because I'm never going to sign!"

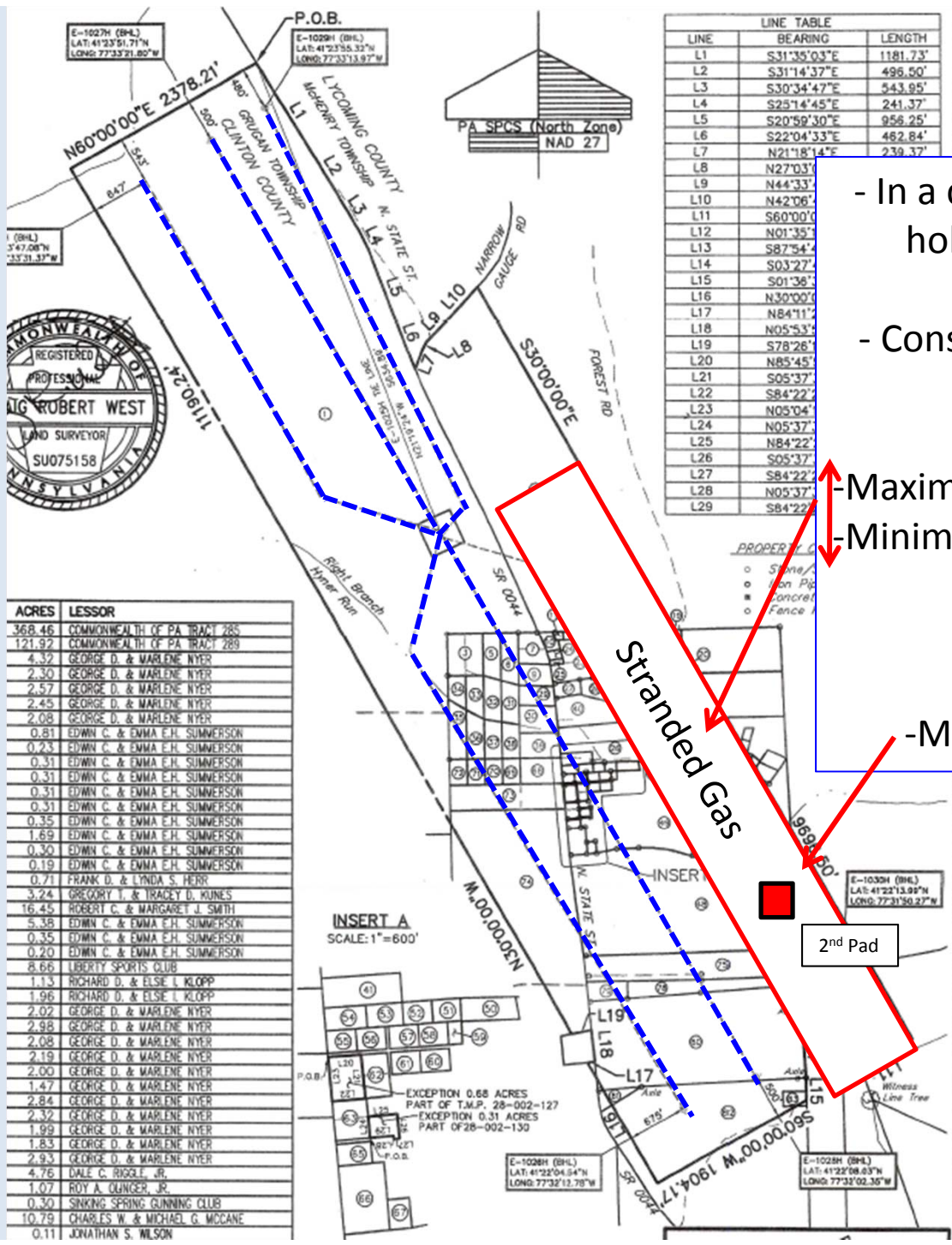
One neighbor said he wished Paul Parker would move back to Pittsburgh already.

Cases like Mr. Parker's have brought attention to the **issue of forced pooling**, which is a practice that allows companies to drill horizontally and gather gas from land they haven't leased. Gov. Tom Corbett opposes the practice, but it's a hot debate in New York, where a drilling moratorium is expected to lift soon.

<http://www.post-gazette.com/pg/11149/1150044-503.stm>



From his collection of documentation on gas leasing and drilling near his home, Paul Parker shows a map of gas leases in Hopewell.



LINE	BEARING	LENGTH
L1	S31°35'03"E	1181.73'
L2	S31°14'37"E	496.50'
L3	S30°34'47"E	543.95'
L4	S25°14'45"E	241.37'
L5	S20°59'30"E	956.25'
L6	S22°04'33"E	462.84'
L7	N21°18'14"E	239.37'
L8	N27°03'30"	
L9	N44°33'30"	
L10	N42°06'30"	
L11	S60°00'00"	
L12	N01°35'30"	
L13	S87°54'45"	
L14	S03°27'30"	
L15	S01°36'30"	
L16	N30°00'00"	
L17	N84°11'30"	
L18	N05°53'30"	
L19	S78°26'30"	
L20	N85°45'30"	
L21	S05°37'30"	
L22	S84°22'30"	
L23	N05°04'30"	
L24	N05°37'30"	
L25	N84°22'30"	
L26	S05°37'30"	
L27	S84°22'30"	
L28	N05°37'30"	
L29	S84°22'30"	

- In a country based on majority rule, one holdout can dictate to the **majority**
 - Conservation laws are written to assure that a holdout does not:
 - Maximize waste for the Majority
 - Minimize economic gain for the Majority
- Or
- Maximize Environmental Footprint

Anadarko Pad E
in
State Forest Tract 285
899.55 Acre Unit

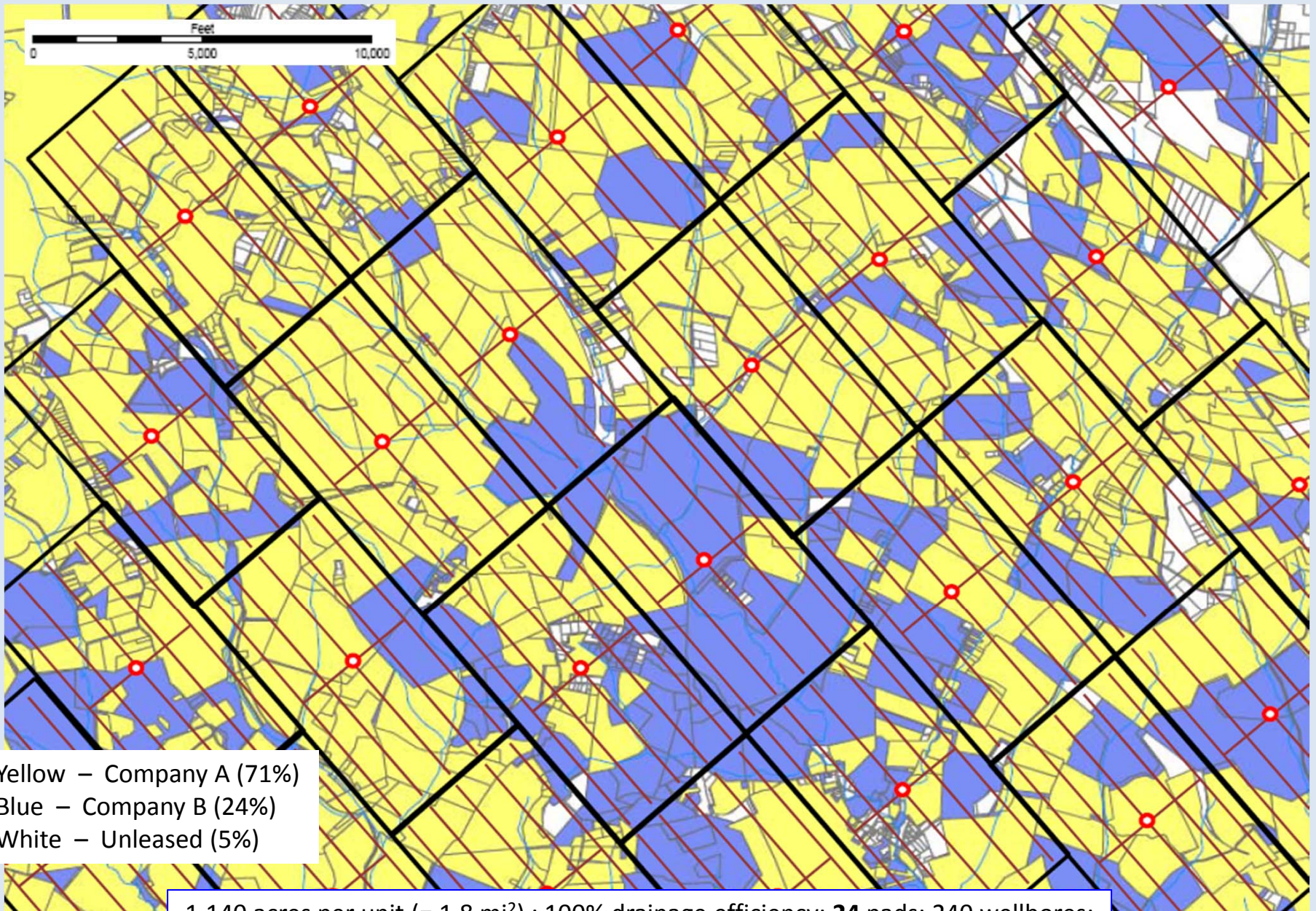
Background:

- Of the various legislative initiatives that have been discussed, **the large drainage unit** (i.e., pooling) has been the most controversial. Landowners who oppose natural gas development have been outraged by a proposal that would allow their property to be included in a natural gas production unit without their consent, even though there would be no surface impact on the land and they would be entitled to receive royalties. Although there was no legislation officially introduced, just the mention of *pooling* ignited a vociferous debate.

Dale A. Tice on February 08, 2011

<http://www.marcellusshalelawmonitor.com/legislation-and-regulation/>

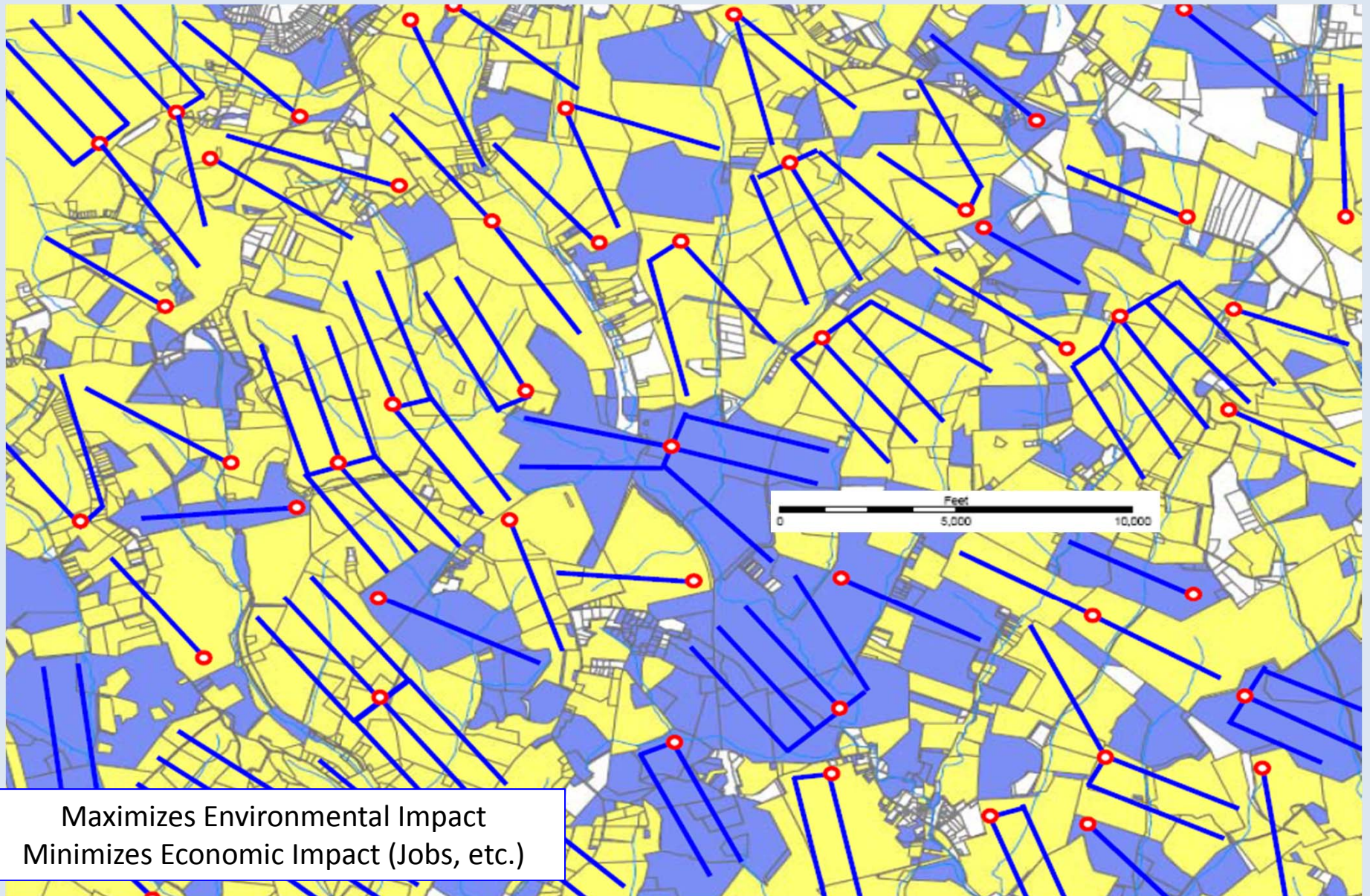
Hypothetical lease position: Marcellus Play, PA (27,000 acres = 42.2 mi²)



Yellow – Company A (71%)
Blue – Company B (24%)
White – Unleased (5%)

1,140 acres per unit (= 1.8 mi²) ; 100% drainage efficiency; **24** pads; 240 wellbores;
960 bcf recoverable gas; \$4.8 billion revenue; \$768 million royalties

Hypothetical lease position: Present state laws



60 % drainage efficiency; 53 pads; 109 wellbores;
436 bcf recoverable gas; \$2.2 billion revenue; \$349 million royalties

Pooling may be the answer for the environmentalists but not for the conservationists, the lessors, & other citizens of the State!

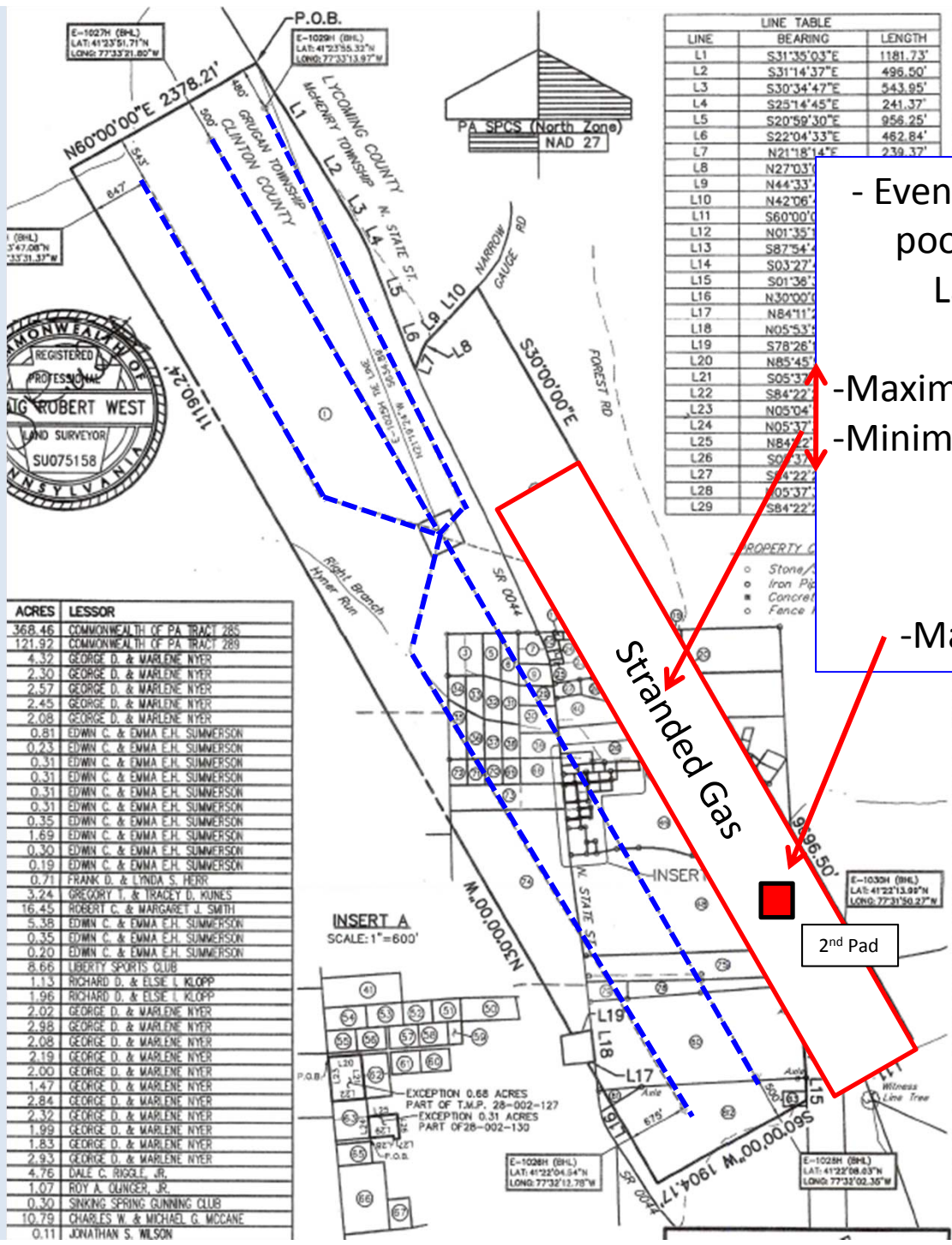
Why?

Subsurface Trespass

- Rules for horizontal drilling in the Commonwealth.
- **Current rule**: Owner can prevent drilling under property without consent!
- **The Ruling**: *Sustrik v. Jones & Laughlin Steel Corp.*, 197 A.2d 44m 46 (Pa. 1957)
 - Recognizing a cause of action for subsurface trespass based on the installation of an underground sewer pipe.



Essay: *Pooling and Unitization in Pennsylvania*,
John K. Baillie, Senior Attorney, Penn Future



- Even if Jones is forced into the Anadarko pool, the ruling for *Sustrik v. Jones & Laughlin Steel Corp* still assures:

- Maximum waste for the Majority
- Minimum economic gain for the Majority

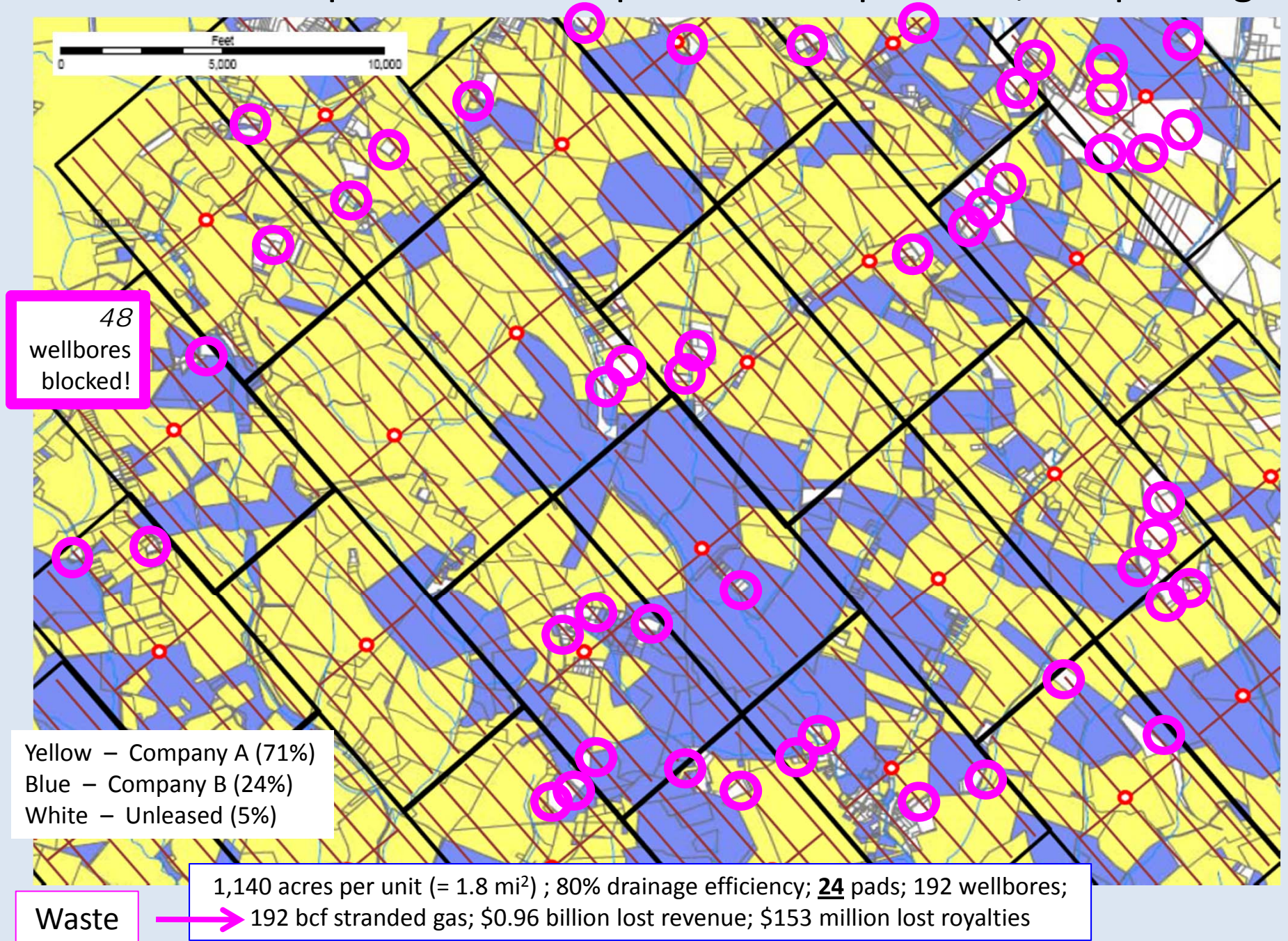
Or

- Maximum Environmental Footprint

- In fact, Jones benefits from the other 82 leases without sacrifice beneath his property

Anadarko Pad E
in
State Forest Tract 285
899.55 Acre Unit

Subsurface trespass is the real post-Sinclair problem, not pooling



Drainage from under non-consenting properties is a lawful practice

- Simple stated, the Rule of Capture allows drainage of unleased land without any benefit to the owner of the mineral rights
- Hydraulic fractures that cross under property boundaries are not subject to the laws of subsurface trespass

Nothing would persuade Mr. Parker to sign a lease, anyway, so he doesn't benefit from a gas-drilling rig right up the road.

Hydraulic Fracturing

Fractures opened by hydraulic pressure generally drain a swath of a production unit about 300-500 feet either side of a well

- This is a common drainage distance even under unleased land

Rock splitting by hydraulic pressure is known to travel as much as 2000 feet from a horizontal well

- Some gas may come from distances up to 2000 feet although the volumes from this distance are very low.

Why might 'Rule of Capture' apply to the gas industry?

- *Hydraulic fracturing is essential to America's energy security* (and PA's economic growth)
- The lateral growth of hydraulic fractures can not be predicted during engineering well design
- The lateral growth of hydraulic fractures can not be controlled during well stimulation
- Drainage after well stimulation and not be restricted within certain defined boundaries

Hydraulic Fracturing Crosses Property Boundary

Unleased property

Marcellus wells are presently not "conservation wells" and can be drilled close to a leased property boundary

Width of Effective Drainage Area!

S_H

S_H

EOG Resources, Inc.
Horizontal wells spudded Q1 2008 - Q1 2009
source: PA DEP

Microseismic Events: Barnett Well
(Fisher et al., 2004, SPE 90051)

Department of Conservation and Natural Resources-PAMAP/USGS
© 2009 Tele Atlas

41°51'47.34" N 76°41'26.56" W

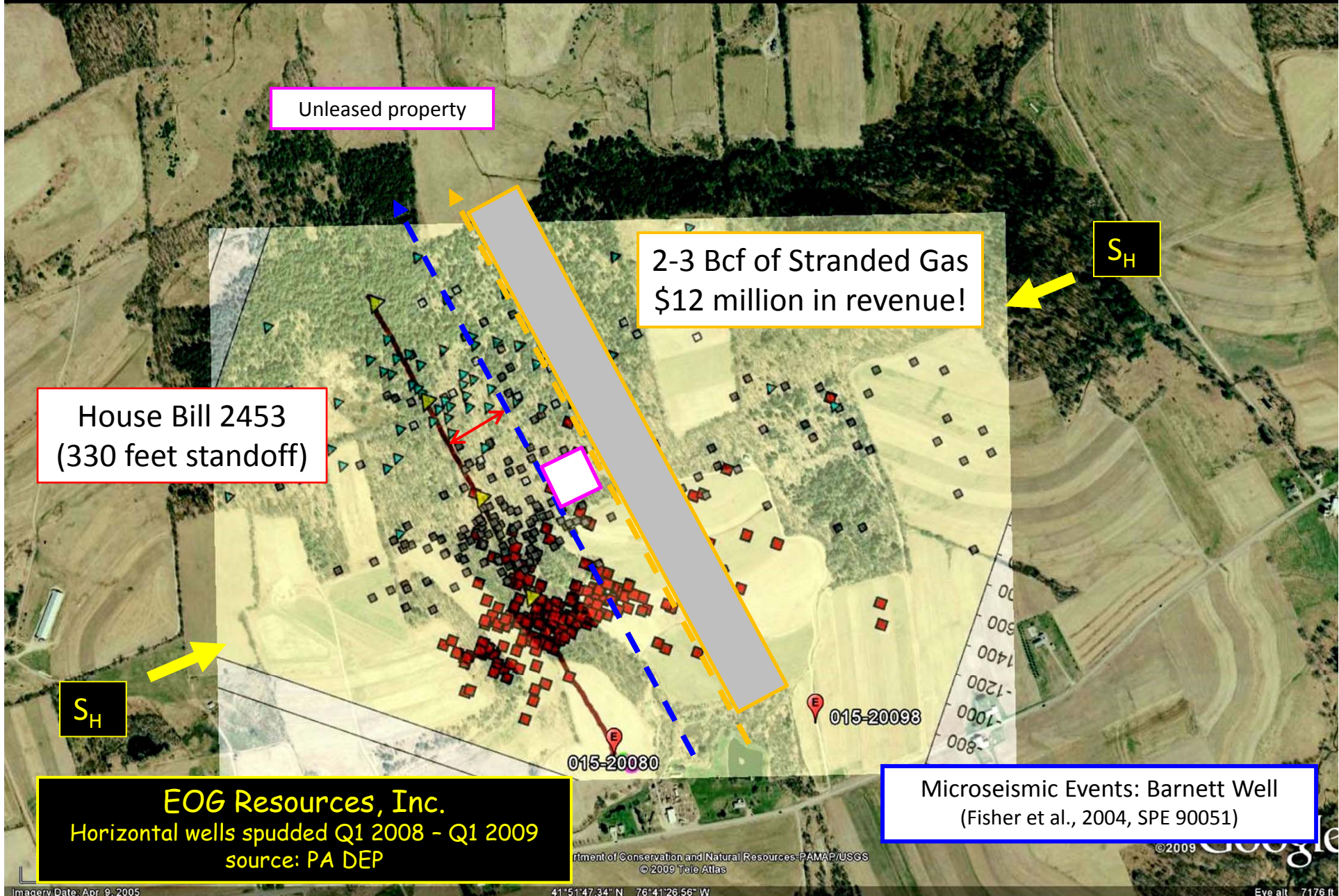
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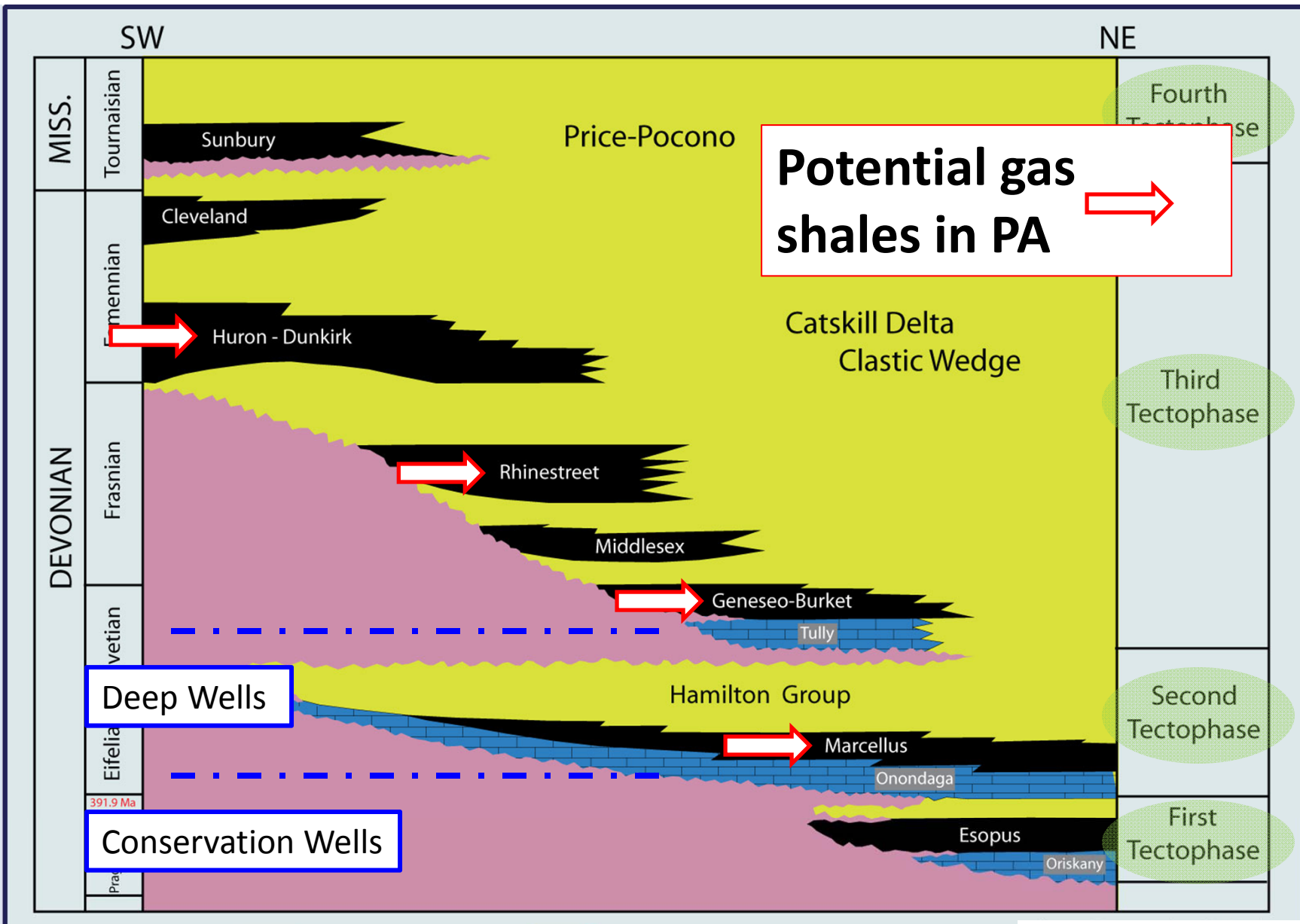
Eye alt 7176 ft

2008 Legislation (not passed)

- **House Bill 2453** - allows Marcellus Shale to be included in “oil and gas conservation law “ Act-359
 - Outcome #1: No well to be drilled within 330 feet of land not leased.
 - Outcome #2: Act-359 sanctions pooling.
- **House Bill 2453** would have engendered further waste because it did not solve the subsurface eminent domain problem!

Hydraulic Fracturing Crosses Property Boundary





House Bill 2453 sets a precedent for stipulating that all gas shales in PA will be drained as by Conservation Wells! Is this a good idea??

The greater public good
would be achieved with
post-Sinclair era legislation
coupling pooling with just
and fair eminent domain of
the subsurface.*

- * 1. Maximized Economic Benefit
- 2. Minimized Wasteful Stranded Gas
- 3. Minimized Environmental Footprint
- 4. Just and Fair Compensation