

# Federal Approaches to Shale Gas and Oil Development: Statutes, Standards, and Studies

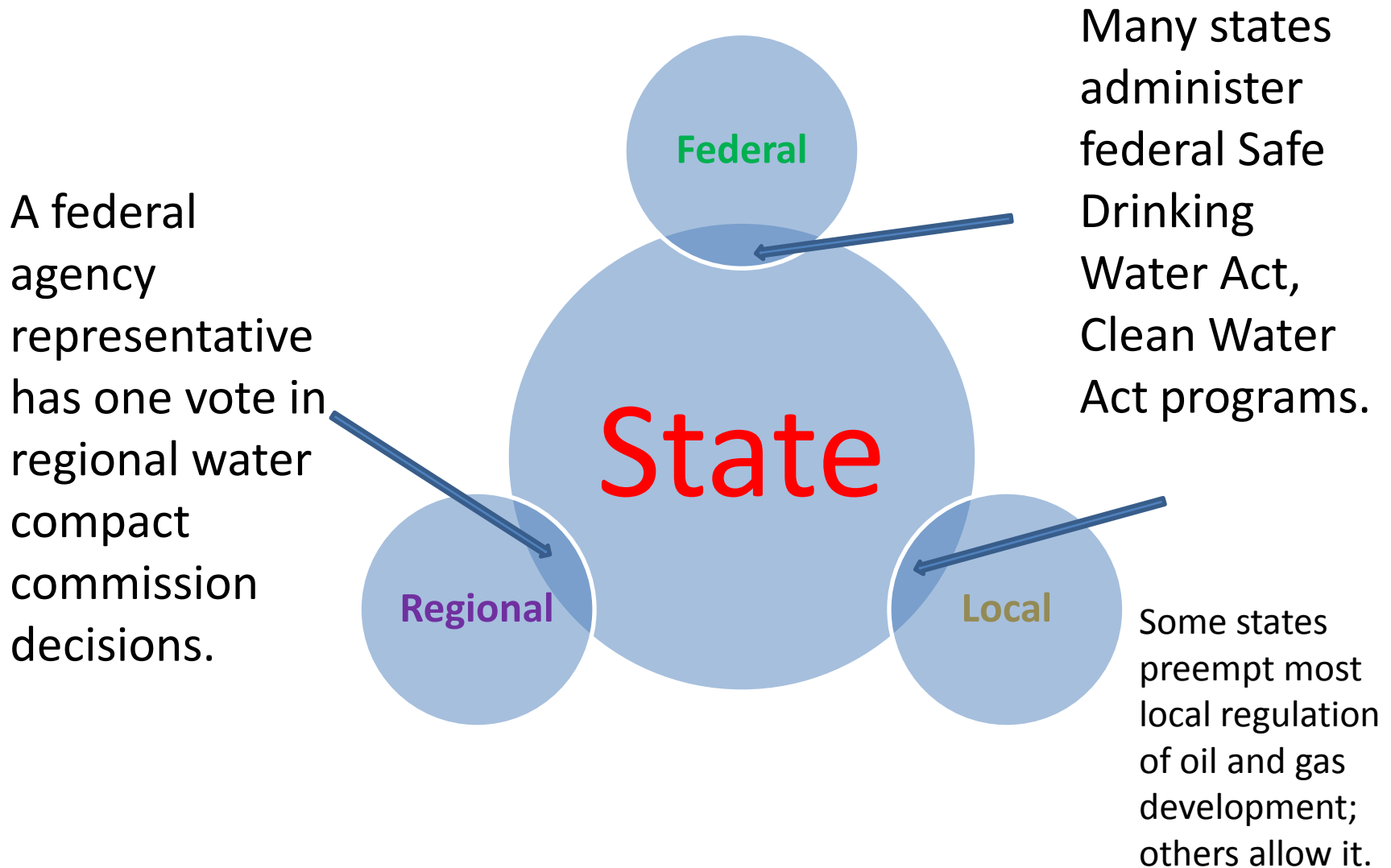
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*How Should Hydraulic Fracturing be Regulated?*  
Columbia Law School, April 19, 2013

# Road map of the presentation

- Introduction to the **role** of the federal government in various aspects of shale gas and oil development (not just fracturing).
- **Substantive descriptions** of federally regulated areas, organized by type of potential impact.
- Brief survey of **regulatory approaches** – information disclosure, soft law, and more.
- Potential **gaps**.

# 1. The federal role: guiding cooperative federalism schemes, directly regulating, and participating in regional commissions



## 2. Regulatory substance from an impacts perspective

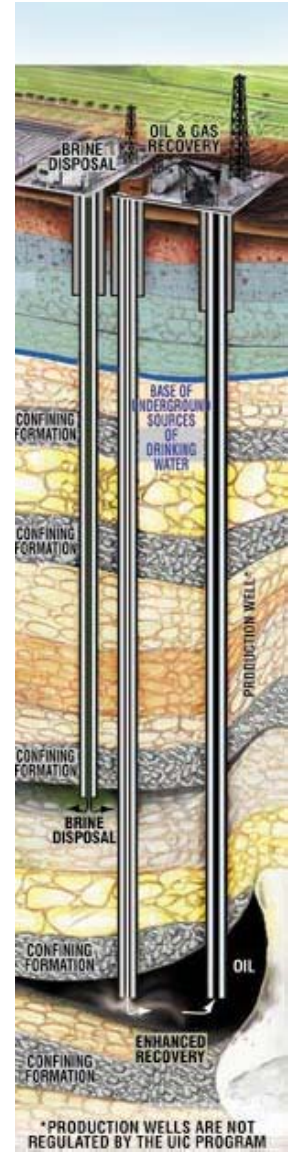
	Federal	State
Groundwater contamination, earthquakes (waste disposal)	Federal Safe Drinking Water Act standards	Typically state-administered
Groundwater contamination (drilling and possibly fracturing)	Fracturing, with exception of diesel, not federally regulated	State casing standards
Surface water contamination	Clean Water Act for direct discharge  Agency threats RE: inadequate wastewater treatment	State water quality acts
Soil contamination, spills	Oil and gas exploration & production wastes exempt from RCRA Subtitle C	States have varying standards for handling of chemicals, wastes
Air quality	Some new federal standards	Some state regulation; few regs. for many emissions
Habitat fragmentation	Few regulations at federal or state level, although Endangered Species Act sometimes relevant	

# Groundwater contamination and earthquakes associated with disposal

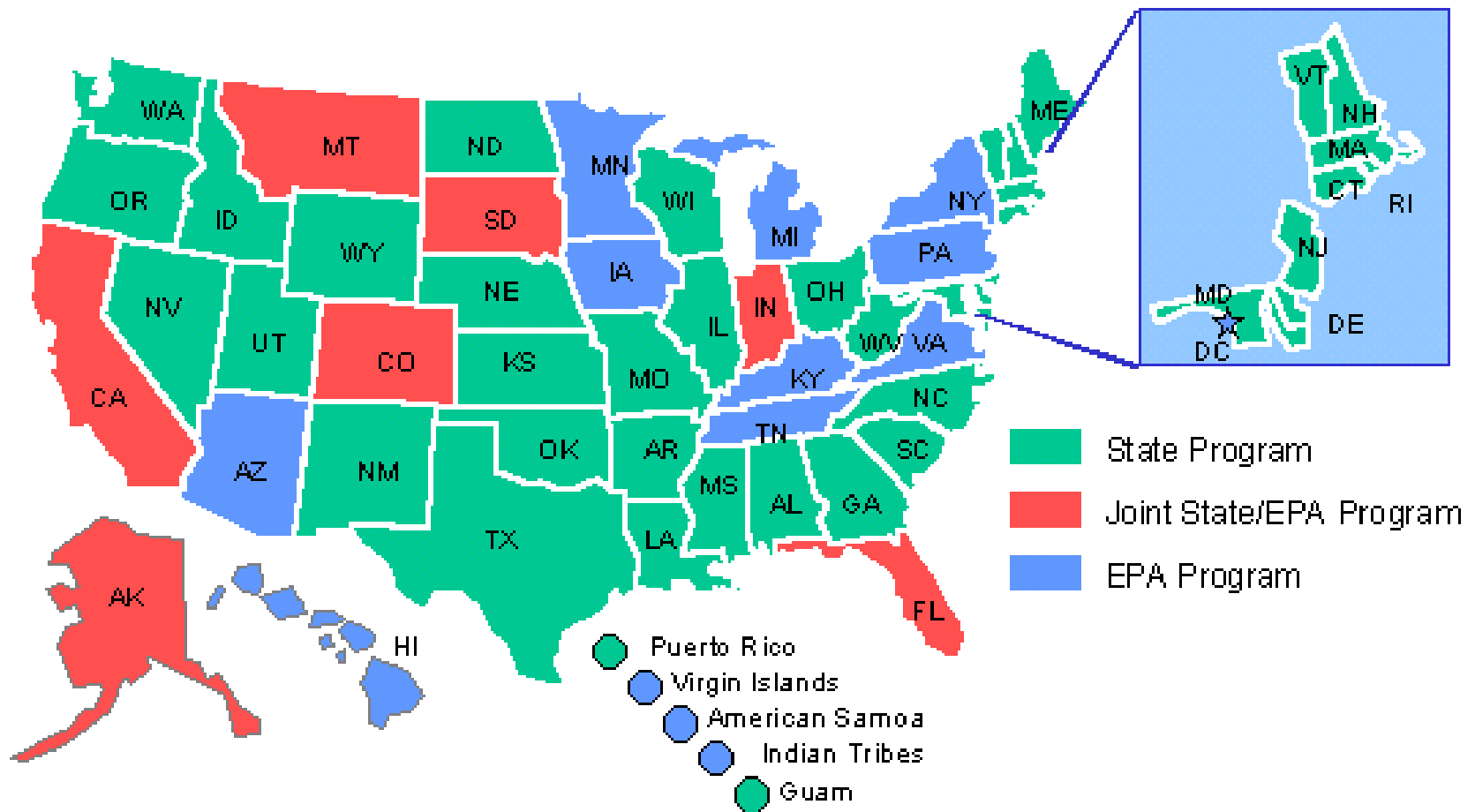
- EPA Safe Drinking Water Act regulations for Class II underground injection control (UIC) disposal wells.
- States often administer these programs through UIC permitting.

42 U.S.C. § 300h

<http://water.epa.gov/type/groundwater/uic/class2/>



# Primacy in Underground Injection Control well permitting



<http://water.epa.gov/type/groundwater/uic/Primacy.cfm>

A UIC well in Texas (which may not contain any wastes from shale wells or fractured wells) contaminated a drinking water aquifer.

Heritage Con--Midland estimation motion-3.pdf - Adobe Reader

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respectfully states as follows.

### I. PRELIMINARY STATEMENT

1. The Debtors, themselves and through their predecessors, have been engaged in the exploration, acquisition, production and sale of crude oil and gas in West Texas since 1984. *See Disclosure Statement*, p. 16. Part of those operations was in the Crittendon field in Winkler County, Texas. Sometime in 2005, it became clear that one (or more) of the Debtors' underground injection wells being used in the Crittendon field leaked. The leaks resulted in the release of a tremendous amount of water contaminated with chloride (and other harmful elements) into the Cenozoic Pecos Alluvium Aquifer (the "**Aquifer**").<sup>3</sup> The rights to the fresh water in the Aquifer are owned by Midland and the water is intended to be a source of drinking water for the citizens of Midland, Texas.

2. Because of these leaks, the Aquifer is now contaminated with a "plume" of

# Groundwater contamination associated with gas and oil well development

- **No Safe Drinking Water Act regulation of the injection of fluids for fracturing**, as opposed to disposal, with the exception of fracturing with diesel. 42 U.S.C. 300h(d)(1)
- States prevent groundwater contamination through casing standards, but some wells have leaked during *drilling* due to inadequate casing.



# Example of casing failure in non-fractured well

East Resources report.pdf - Adobe Reader

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## 8.0 SUMMARY AND CONCLUSIONS

### 8.1 Summary

In 2008 and 2009, East Resources, Inc. (ERI) initiated a drilling program in McNett Township, Lycoming County, PA. As part of the program, ERI drilled four gas wells into the Oriskany Formation underlying the area. Of these wells, three were completed and one was plugged. The production pipeline for the wells was in the permitting process at the time of completion; therefore the wells were shut in. In July 2009, a casing/collar failure occurred in the DelCiotto No. 2 gas well which resulted in the release of natural gas into the subsurface. The gas release resulted in sediment and gas migration into streams, groundwater wells, springs, culverts, and a residential structure. As a result, ERI

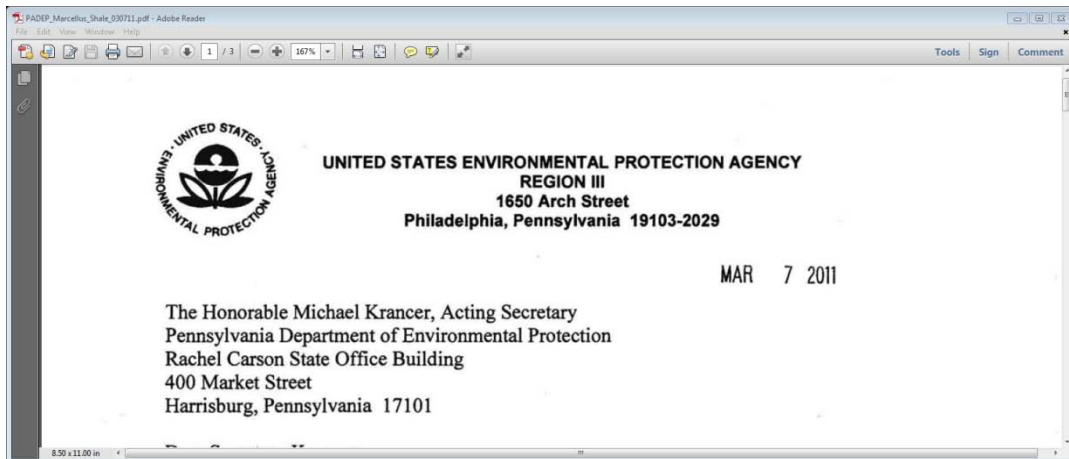
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# Surface water contamination

- Under the Clean Water Act, east of the 98<sup>th</sup> meridian, no discharge of oil and gas wastes into water.
- West of the 98<sup>th</sup> meridian, certain discharge allowed if first treated to lower grease content.  
40 C.F.R. §§ 435.30, 435.50, 435.52.
- For disposal through wastewater treatment plants, EPA is writing rules—anticipated by 2014.

<http://water.epa.gov/scitech/wastetech/guide/upload/shalereporterfactsheet.pdf>

# Agency threats in the wastewater treatment context

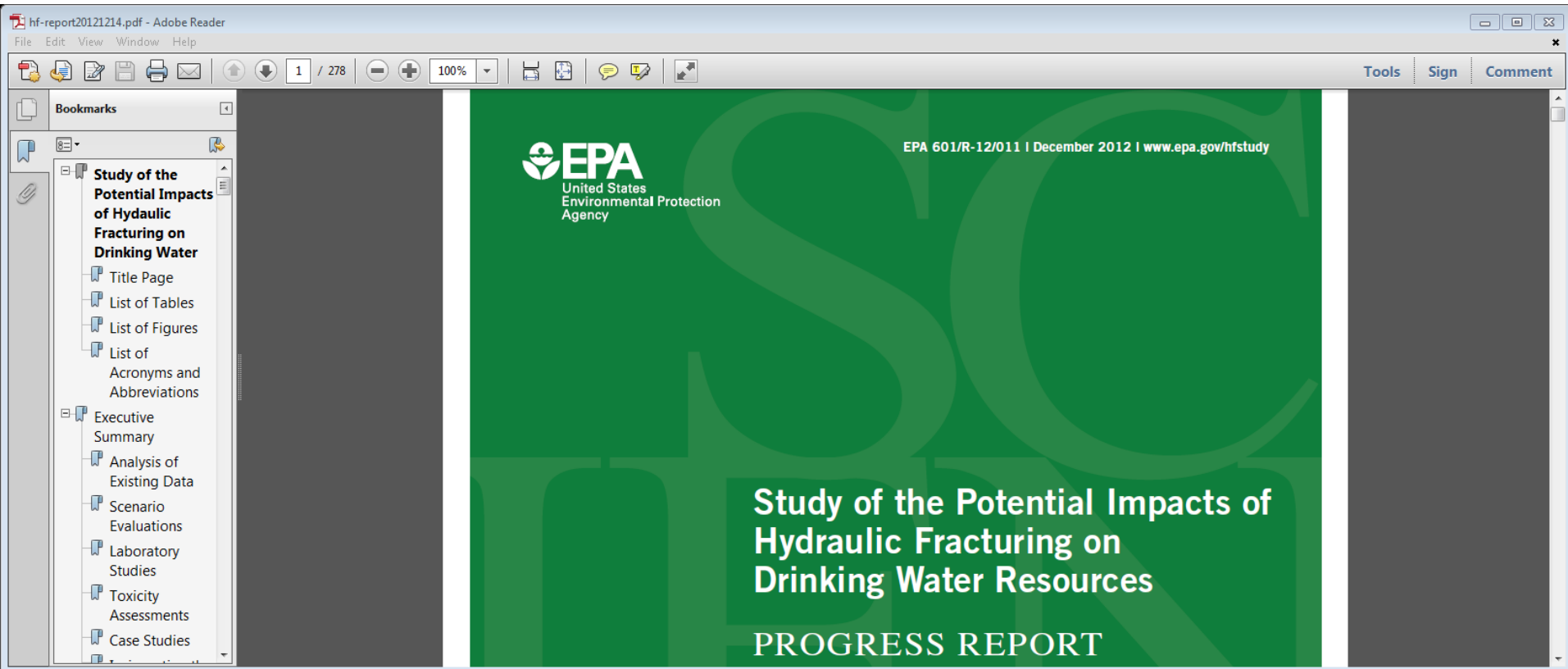


[http://www.epa.gov/region3/marcellus\\_shale/PADEP\\_Marcellus\\_Shale\\_030711.pdf](http://www.epa.gov/region3/marcellus_shale/PADEP_Marcellus_Shale_030711.pdf)

wastewater treatment facilities that accept wastewater from gas drilling operations; and expanded ambient water quality monitoring to include chemicals that could indicate the presence of incompletely treated drilling wastewater. The U.S. Environmental Protection Agency (EPA) supports these actions and urges you to implement them aggressively.

Nevertheless, several sources of data, including reports required by PADEP, indicate that the wastewater resulting from gas drilling operations (including flowback from hydraulic fracturing and other fluids produced from gas production wells) contains variable and sometimes high concentrations of materials that may present a threat to human health and aquatic environment, including radionuclides, organic chemicals, metals and total dissolved solids. Many of these substances are not completely removed by wastewater treatment facilities, and their discharge may cause or contribute to impaired drinking water quality for downstream users, or harm aquatic life. In addition, high concentrations of these substances may adversely impact the treatment facilities themselves, impairing their ability to remove fecal coliform and other common contaminants in domestic sewage.

House Report 111-316 -- associated with Public Law 111-99-Oct. 30, 2009, Interior Department and Further Continuing Appropriations, Fiscal Year 2010 -- requested an EPA study.



<http://www2.epa.gov/sites/production/files/documents/hf-report20121214.pdf>

# Soil (and water) contamination and spills

- Oil and gas **exploration and production (E&P) wastes exempt from the hazardous waste portion of the Resource Conservation and Recovery Act.** 53 Fed. Reg. 25,446-01, 25,447 (July 6, 1988)
- States, not the federal government, determine how wastes should be stored on site and disposed of.

- Texas Barnett shale: Driveway, pasture, pond polluted with low chloride drilling fluids diluted with rain water. Permit 630921.
- Colorado tight sands: “Accumulation of oil in produced water pit. Excessive oil accumulation at tank battery. Berm not sufficient at tank battery. Excessive oil on ground at wellhead, oil is migrating down grade (from wellhead) toward upper pit. Wildlife accessing both pits.” API 05-103 -08459.

- New Mexico tight sands: “Someone opened the valves on two frac tanks releasing KCL water, spilling 800 [barrels], none recovered.” API 30-045-34815.
- Pennsylvania Marcellus: “Flowback fluids overtopping tanks spilling out of open manholes onto ground surface beyond secondary containment.” Permit 115-20341.

*New Mexico Oil Conservation Division*

**Cases Where Pit Substances Contaminated New Mexico's Ground Water**

Current Company	Facility Name	Tracking Number in OCD's Imaging System	County	Location	Status
APACHE CORP	SKELLY PENROSE "A" CENTRAL BATTERY	1RP-026-0	Lea	-4-23S-37E	CLOSED
APACHE CORPORATION	Apache Corporation NEDU 527 Pit	AP-068-0	Lea	-10-21S-37E	ACTIVE
ARCO PERMIAN	SOUTH JUSTIS UNIT F-230	1RP-039-0	Lea	C-25-25S-37E	ACTIVE
ARCO PERMIAN	WOOD WN FEDERAL COM #1	3RP-057-0		-21-29N-10W	CLOSED
BAKER OIL TOOLS	HOBBS FACILITY	1RP-043-0	Lea	N-32-18S-38E	ACTIVE
BLOCKER, GEORGE M	GEORGE BLOCKER WATER WELL	1RP-047-0	Lea	-13-25S-37E	ACTIVE
BP AMERICA PRODUCTION	BP America Prod Co GCU 93	3RP-411-0	San Juan	E-36-29N-12W	ACTIVE
BP AMERICA PRODUCTION CO	GCU #194	3RP-389-0	San Juan	D-5-27N-12W	ACTIVE
BP AMERICA PRODUCTION COMPANY	BOYD GC #1-A	3RP-004-0		-8-31N-10W	ACTIVE
BP AMERICA PRODUCTION COMPANY	CANDELARIA GAS COM #1	3RP-005-0		-18-29N-9W	CLOSED
BP AMERICA PRODUCTION COMPANY	CAPSON B #1	3RP-006-0		-28-29N-9W	ACTIVE
BP AMERICA PRODUCTION COMPANY	EATON A #1E	3RP-008-0		-25-29N-11W	CLOSED
BP AMERICA PRODUCTION COMPANY	FLORANCE GAS COM #16A	3RP-009-0		-6-30N-9W	ACTIVE
BP AMERICA PRODUCTION COMPANY	FLORANCE Z 40	3RP-013-0		--N-W	ACTIVE
BP AMERICA PRODUCTION COMPANY	GCU #107	3RP-015-0		-19-29N-12W	CLOSED
BP AMERICA PRODUCTION COMPANY	GCU #145	3RP-016-0		A-26-29N-12W	CLOSED
BP AMERICA PRODUCTION COMPANY	GCU #153E	3RP-017-0		C-28-29N-12W	ACTIVE
BP AMERICA PRODUCTION COMPANY	GCU #165	3RP-018-0	San Juan	H-29-28N-12W	CLOSED
BP AMERICA PRODUCTION COMPANY	GCU #169	3RP-393-0	San Juan	I-35-29N-12W	ACTIVE
BP AMERICA PRODUCTION COMPANY	GCU #188	3RP-396-0	San Juan	J-30-29N-12W	ACTIVE
BP AMERICA PRODUCTION COMPANY	GCU #194	3RP-387-0	San Juan	D-5-27N-12W	ACTIVE
BP AMERICA PRODUCTION COMPANY	GCU #202	3RP-020-0		B-33-29N-12W	CLOSED
BP AMERICA PRODUCTION COMPANY	GCU #93E	3RP-014-0		L-36-29N-12W	CLOSED
BP AMERICA PRODUCTION COMPANY	GCU COM D #160	3RP-022-0	San Juan	I-27-29N-12W	CLOSED



# Air quality

- New EPA New Source Performance Standards for **volatile organic compounds emitted as a result of fracturing and refracturing.**

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The EPA Administrator, Lisa P. Jackson, signed the following notice on 4/17/2012, and EPA is submitting it for publication in the *Federal Register* (FR). While we have taken steps to ensure the accuracy of this Internet version of the rule, it is not the official version of the rule for purposes of compliance. Please refer to the official version in a forthcoming FR publication, which will appear on the Government Printing Office's FDSys website (<http://fdsys.gpo.gov/fdsys/search/home.action>) and on Regulations.gov (<http://www.regulations.gov>) in Docket No. EPA-HQ-OAR-2010-0505. Once the official version of this document is published in the FR, this version will be removed from the Internet and replaced with a link to the official version.

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA-HQ-OAR-2010-0505; FRL- ]

RIN 2060-AP76

Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews

AGENCY: Environmental Protection Agency (EPA).

# Habitat fragmentation issues – left to the states, and not typically addressed. (**Compare with Surface Mining Control and Reclamation Act.**)

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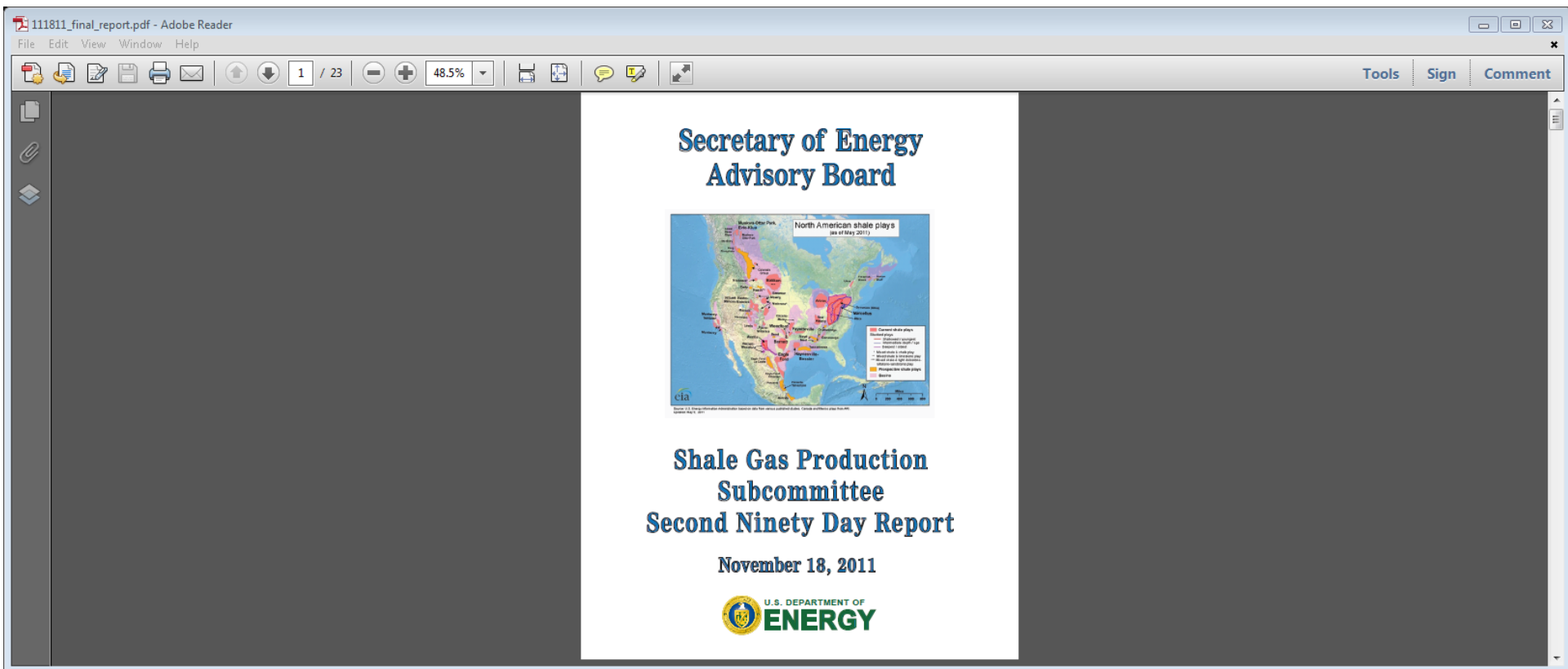
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Vern Whitten Photography

[http://www.ndoil.org/image/cache/NDPCAnnual092111\\_2.pdf](http://www.ndoil.org/image/cache/NDPCAnnual092111_2.pdf)

# More comprehensive approaches: federal recommendations



[http://www.shalegas.energy.gov/resources/111811\\_final\\_report.pdf](http://www.shalegas.energy.gov/resources/111811_final_report.pdf)

### 3. Other approaches at the national level

- Information disclosure (industry-state agency collaborations): **FracFocus Chemical Disclosure Registry**, Ground Water Protection Council's **Risk-Based Data Management System**.
- Performance standards developed through the **Center for Sustainable Shale Development**.
- **State Review of Oil and Natural Gas Environmental Regulations** – industry-nonprofit-government voluntary reviews.

## 4. Potential gaps

- Inadequate **state resources**? (Likely not solved by a shift to the federal level, absent budget modifications.)
- Lack of adequate information for states: **federal database** that would allow states to compare regulatory approaches at each stage of shale gas and oil development, on a state-by-state basis, should be a top priority.
  - Excellent opportunity for industry-government-university collaboration.

# State resources: inspectors and well numbers (including conventional wells)

	CO 2012	LA 2011	MI 2012	NM 2012	OH 2012	PA 2010	TX 2012
Number of field inspectors	<b>36</b>	<b>59</b>	<b>27</b>	<b>12</b>	<b>40</b>	<b>76</b>	<b>153</b>
Approximate number of active oil and gas wells	<b>49,062</b>	not yet identified	<b>15,742</b>	<b>56,366</b>	<b>55,083</b>	<b>92,326</b>	<b>279,856</b>

Data from Margaret Ash, Field Inspections Mgr., Colorado Oil & Gas Conservation Comm'n.; John Adams, La. Dep't of Nat. Resources Envtl. Div.; Stephen Riley, Permitting Geologist, Ohio Dept. of Nat. Resources, Leslie Savage, Chief Geologist, Railroad Comm'n of Texas, and other agency staff and agency documents. For complete footnotes, see Wiseman, *Regulatory Risks in Tight Gas and Oil Development*, forthcoming, NATURAL GAS & ELECTRICITY. For full table and citations, see Natural Gas and Electr., Wiley, Dec. 2012.

# Substantive gaps

- State requirements for **storage and disposal of RCRA Subtitle C-exempt wastes** differ. Some require closed tanks; others still allow pits and do not constrain the location of pits.
- **Casing requirements** – varied requirements for mandatory depth below groundwater, strength of casing.
- Ohio has updated its **underground injection control disposal well permitting requirements** to address seismicity concerns; other states have lagged.