



State and Federal Roles in Hydraulic Fracturing Activities

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EPA Perspective on Hydraulic Fracturing

- Natural gas is a critical source of energy for the U.S.
- Need to develop our oil and gas resources in a responsible manner
- We do not need to choose between developing our energy resources and protecting the public's health and our vital drinking water resources



National, Regional, State and Local Concerns

- National, regional, state and local concerns:
- Water availability
- Well siting
- Well construction
- Injectate characterization and reporting
- Waste disposal
- Groundwater and surface water contamination
- Air emissions
- Public safety and worker safety



State Roles: Water Availability

- Some state oil and gas regulatory agencies and interstate agencies have programs that:
 - Require specific authorization for water withdrawals
 - Require water management plans (water source, schedule, wastewater treatment/disposal plan)
- They do not necessarily address resource management on watershed/regional aquifer basis



State Roles: Well Siting

- State oil and gas production and interstate agency regulations may require minimum setbacks from surface water intakes and water supply wells
- These regulations may also address setbacks from rivers, streams, and reservoirs
- Some communities have developed local ordinances and zoning requirements for control of well siting
 - Challenges have been sustained in some cases
 - State law pre-emption



State Roles: Well Construction

- State oil and gas production regulatory agencies establish requirements for well construction
- Requirements include: casing design, cement selection and practices, well logging and other testing, and well perforation
- Drilling practices and well construction have been linked to methane migration due to
 - Incomplete cementing
 - Misaligned casing
- Improperly abandoned/orphaned wells can contribute to methane migration



State Roles: Injectate Characterization and Reporting

- An increasing number of States are requiring more complete disclosure of chemicals used in hydraulic fracturing
- The Ground Water Protection Council and the Interstate Oil and Gas Compact Commission have developed **FracFocus**, a website where service companies provide data on hydraulic fracturing fluid constituents
 - Information on well-specific basis, including location
 - Educational information on hydraulic fracturing process, chemicals used
 - Links to State oil and gas regulatory agencies



State Roles: Waste Disposal

- States regulate varying aspects of waste disposal including:
 - On site storage and transport of waste fluids
 - Solid waste management
- States are often the implementing authority for federal requirements



State Roles: Other

- On site storage and mixture of fracturing fluids
- Noise containment
- Storm water mitigation and management
- Site access road standards
- Resource transport and storage (right of way)
- Site restoration



Federal Roles: Water Authorities Applicable to Hydraulic Fracturing

Clean Water Act

- Water quality criteria and standards
- Effluent Limitations Guidelines and Standards (ELG)
- National Pollutant Discharge Elimination System Permitting

Safe Drinking Water Act

- Underground Injection Control Program regulations
 - 39 states, 3 territories, 2 tribes
 - Produced water/flowback injection
 - Hydraulic fracturing (HF) using diesel fuels
- National Primary Drinking Water Standards
- Emergency Powers



Federal Roles: Groundwater and Surface Water Contamination

- Shale gas flowback and produced water (brine) is typically disposed by:
 - Deep injection in a SDWA UIC permitted Class II well
 - Treatment and discharge at a CWA NPDES permitted publicly owned treatment works (POTWs), or a centralized waste treatment facility (CWT)
- Discharge of treated wastewater to surface waters has raised concerns of possible impacts to drinking water



Federal Roles: SDWA

The SDWA requires EPA to protect underground sources of drinking water (USDWs) from contamination caused by underground injection.

- Protect USDWs from diesel fuels injection related to oil, gas, and geothermal hydraulic fracturing
 - Developing guidance (well siting, construction, mechanical integrity testing, and etc.) for oil and gas injection using diesel fuels
- Protect USDWs from brine injection (flowback and produced waters) for disposal
- Minimize injection induced seismicity that may endanger USDWs
- Provide safe drinking water in compliance with the National Primary Drinking Water Regulations (NPDWRs)

Note: States with Primacy implement federal laws



Federal Roles: CWA

The CWA establishes the basic structure for regulating discharges of pollutants into surface waters and water quality standards

- Prohibits the discharge of shale gas wastewater into navigable waters except through CWTs or POTWs.
 - Developing categorical pretreatment standards for shale gas discharges to POTWs and CWTs
 - Developing guidance for NPDES permit writers to address produced water disposal and discharge
 - Developing hauled waste guidance for POTWs
 - Developed FAQs to guide regional regulation of shale gas waste water disposal through POTWs and CWTs in the Marcellus



Monitoring

- Bromines
- Total Dissolved Solids
- Radionuclides
- Sodium
- Potassium
- Ethylene glycol
- BTEX



Research

- US EPA Study - HF impact on DW resources <http://www.epa.gov/hfstudy/index.html>
- USGS - Radium Content of Oil- and Gas-Field Produced Waters in the Northern Appalachian Basin (USA): <http://pubs.usgs.gov/sir/2011/5135/>
- New York Draft Supplemental Generic Environmental Impact Statement - To assess issues unique to horizontal drilling and high-volume hydraulic fracturing in the Marcellus: <http://www.dec.ny.gov/energy/46288.html>
- Duke University Study - Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing: <http://www.nicholas.duke.edu/cgc/pnas2011.pdf>
- Cornell University - Methane and the greenhouse-gas footprint of natural gas from shale formations: <http://www.sustainablefuture.cornell.edu/news/attachments/Howarth-EtAl-2011.pdf>
- Resources for the Future – Managing the Risks of Shale Gas: Identifying a Pathway toward Responsible Development: http://www.rff.org/centers/energy_economics_and_policy/Pages/Shale_Gas.aspx



Strategies for Preventing Ground Water and Surface Water Contamination

- Proper safeguards can protect groundwater and surface water
 - Fluid characterization and disclosure
 - Well design, construction, testing and operation
 - Fluid isolation
 - Water and waste management
 - Sufficient staffing and training
 - Meet minimum federal requirements
 - Public participation
 - Flexibility to accommodate variations in geology and other site specific conditions
- Close communication and coordination among federal and state partners



Strategies for Preventing Ground Water and Surface Water Contamination

- State Drinking Water and Water Quality Programs establish dialogue with State Oil and Gas Regulatory Programs
- Enhance awareness of activities in drinking water source watersheds and near water supply wells
- Reach out to well drillers and operators to share information on sources, sensitive/protection areas, service areas; encourage sound stewardship practices
- Develop thorough water quality baseline (including ground water quality)
- Augment source (and finished) water quality monitoring at PWS to build understanding of natural/normal variability
- Establish communication with drillers, well operators, to facilitate notification of spills, unusual events



Thank You!

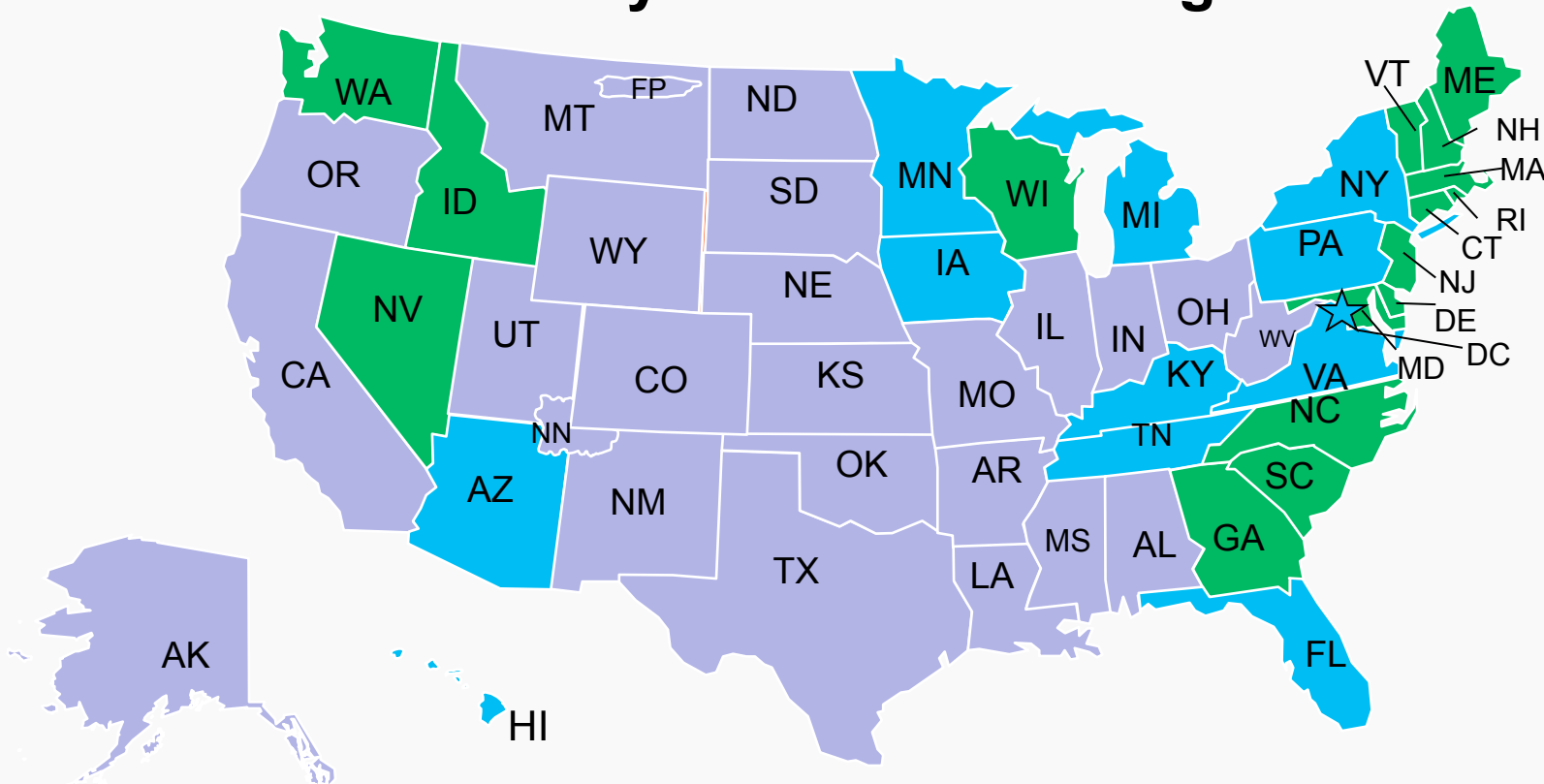


EPA Hydraulic Fracturing Website:
www.epa.gov/hydraulicfracturing

We Can Cultivate Energy and Protect Water Resources



Primacy - Class II UIC Program



- 23 States and 2 Tribes have UIC Class II implementation authority (primacy) under SDWA Section 1425
- 16 States and 3 Territories have UIC Class II primacy under SDWA Section 1422
- EPA directly implements the Class II program in 11 States, D.C., 2 Territories, and for numerous Tribes