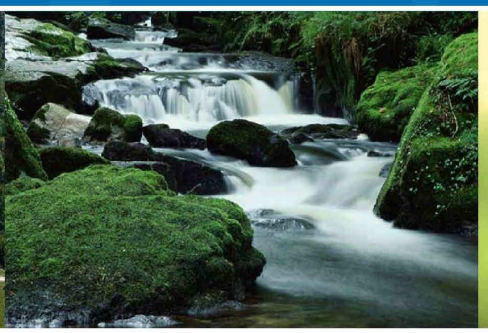
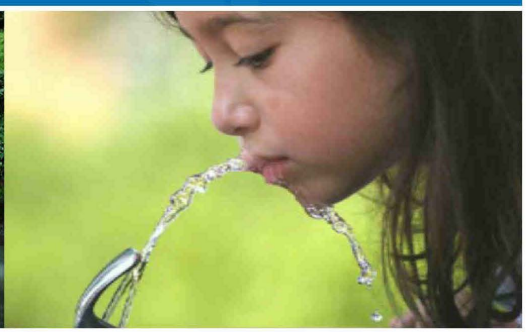
United States
Environmental Protection
Agency

Hydraulic Fracturing – Overview and EPA Actions

Clean Water Act: Law and Regulation
September 21, 2012

Water Law Office
Office of General Counsel
U.S. EPA

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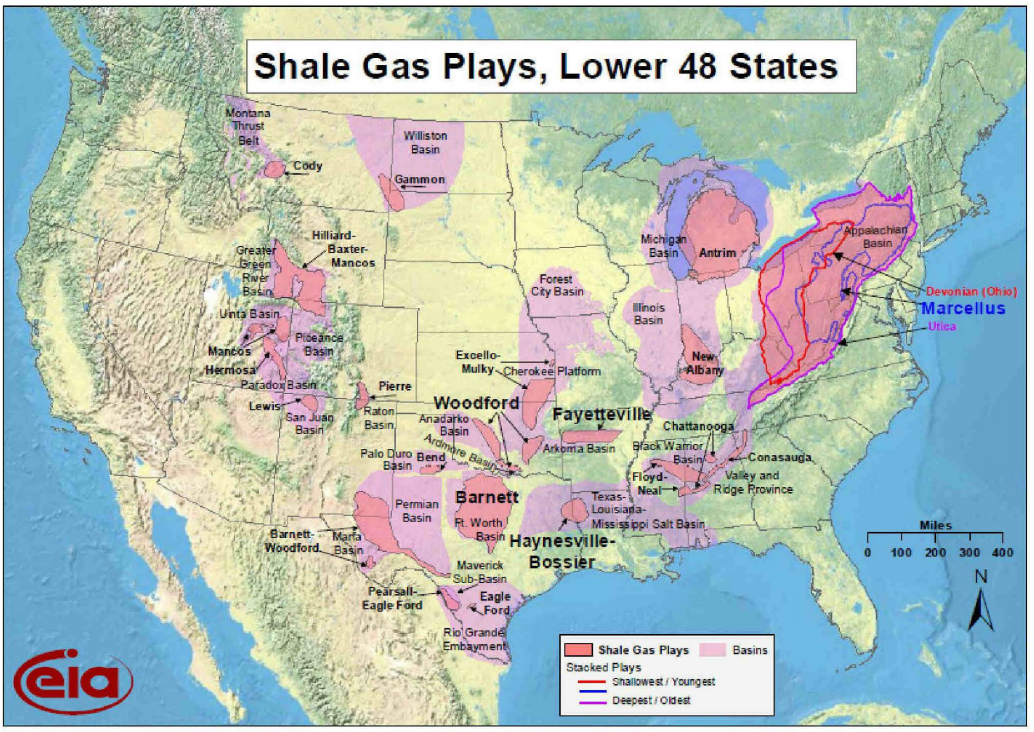
Overview

- What is hydraulic fracturing?
- What are the environmental concerns?
- What is EPA doing to address these concerns?
  - Regulation and policy development
  - Research
  - Enforcement initiative

Natural Gas Extraction: Expansion

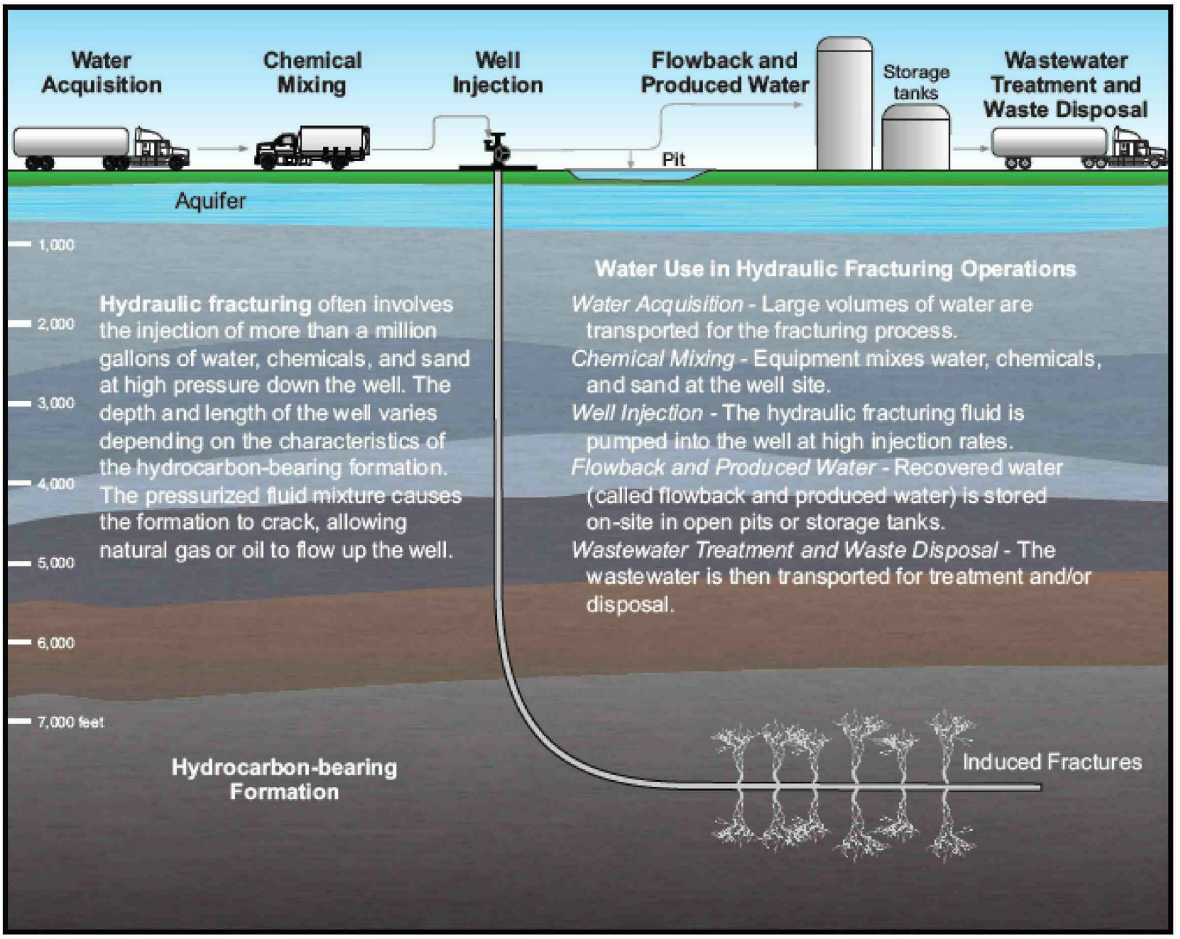
Advances in hydraulic fracturing and horizontal drilling have opened new areas for oil and gas development.



Source: Energy Information Administration based on data from various published studies.
Updated: March 10, 2010

United States Environmental Protection Agency

Overview of Hydraulic Fracturing: Water Use



Natural Gas Extraction: Environmental Concerns

- Health and environmental concerns raised about natural gas exploration, drilling and production
  - Water quality (spills, migration, poor well construction, wastewater disposal)
  - Water quantity
  - Air emissions
  - Induced seismicity

- Environmental regulations help ensure safe and responsible natural gas production

EPA Actions– Safe Drinking Water Act (SDWA)

- **Underground Injection Control Program**
  - The UIC Program protects USDWs by setting requirements for injection wells that prevent endangerment to underground sources of drinking water (USDWs).
  - **2005 Energy Policy Act** revised the SDWA's definition of "underground injection" to exclude "the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities."
  - Both injection of diesel fuels during hydraulic fracturing and injection of flowback and/or produced water is subject to UIC permitting requirements – mostly State permitting
  - In May 2012 EPA issued draft permitting guidance for EPA permit writers addressing oil and gas hydraulic fracturing using diesel fuels.
- **SDWA section 1431 imminent and substantial endangerment authority**

EPA Actions– Clean Water Act (CWA)

•Natural gas drilling can result in discharges to surface waters. The discharge of this water is subject to requirements under the CWA.

•**Direct Discharges**:

- •The CWA prohibits the discharge of pollutants by point sources into waters of the United States, except in compliance with certain provisions of the CWA, including NPDES permits. 33 U.S.C. 1311(a).
- •The technology-based requirements for direct discharges from oil and gas extraction facilities into surface waters are found in 40 CFR Part 435
  - • Current Oil and Gas Extraction effluent guidelines for onshore operations has zero discharge requirement

•**Indirect Discharges**:

- •Sewer systems connected to POTWs that discharge to waters of the U.S.
- •Discharge regulations for indirect dischargers are pretreatment standards.

•**Statutory exemption for stormwater runoff** for most oil and gas field activities (CWA § 402(l)(2))

EPA Actions– Clean Water Act (CWA)

- **Development of national treatment standards for wastewater discharges related to hydraulic fracturing**
  - Effluent Limitations Guidelines Plan (CWA Section 304(m))
    - **Coalbed Methane:** will address the wastewater discharges associated with natural gas extraction from coalbeds.
    - **Shale gas:** will provide additional controls for pretreatment of wastewater discharges from shale gas extraction utilizing hydraulic fracturing.

- **Frequently Asked Questions (FAQs) document – March 2011**
  Guidance on CWA requirements for wastewater in Marcellus Shale

- **Updating Chloride Water Quality Criteria –** flowback/produced water has high levels of TSDs/chlorides which impact aquatic life

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EPA Actions– Clean Water Act (CWA)

- **Oil Pollution Prevention Requirements**
  - EPA has promulgated regulations that require facilities to prevent and prepare for oil discharges/spills. 40 CFR part 112
  - The Spill Prevention Control and Countermeasures (SPCC) rule requires facilities meeting the applicability criteria to develop a spill prevention plan and implement oil spill prevention measures
  - Typically hydraulic fracturing operations include oil storage in excess of the regulatory oil storage thresholds (>1320 gallons oil aboveground)
  - Information on EPA's Oil Program is available on the program's website: www.epa.gov/oilspill
  - EPA has developed a spill prevention page for the upstream sector:
    - http://www.epa.gov/emergencies/content/spcc/spcc_up.htm
- **Oil Spill Reporting Requirements (The Sheen Rule)**
  - EPA regulations at 40 CFR part 110 reporting of harmful quantities of oil discharges to the National Response Center (NRC): 1-800-424-8802 or 1-202-426-2675

EPA Actions – Clean Air Act (CAA)

NSPS for Oil and Gas Production Industry, promulgated April 2012

- Identified unregulated sources of emissions:
  - Well completions (and re-completions)
  - Pneumatic controllers
  - Storage vessels (condensate and crude oil tanks)
- Well Completions (and re-completions)
  - The NSPS limits VOC emissions from gas wells as they are being prepared for production, a process called "well completion."
  - It would apply to hydraulically fractured ("fracked") wells, both new wells and existing wells that are fracked or refracked to get more gas out of a well.
  - The rule phases in the requirement to conduct green completion to capture and treat natural gas. It also allows combustion for certain wells (wildcat, delineation, and low pressure wells) and for portion of flowback emissions where green completion is not feasible.

NESHAP for Oil and Gas Production Industry, amended April 2012

- includes standards for unregulated glycol dehydrators and lower the leak detection and repair level for valves at natural gas processing plants.

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EPA Actions– Toxic Substances Control Act (TSCA)

- **TSCA Section 21 Petition**
  - In August 2011, Earthjustice and others petitioned EPA to use TSCA to issue rules requiring makers of chemicals used in oil and gas production to provide information to EPA on the health effects of these chemicals.
  - In November 2011, EPA notified the petitioners that the Agency is partially granting the petition and will initiate a rulemaking process to obtain data on chemical substances used in hydraulic fracturing; intended to complement state well-by-well disclosure programs.
  - Expect stakeholder process to discuss the design and scope of TSCA reporting requirements.

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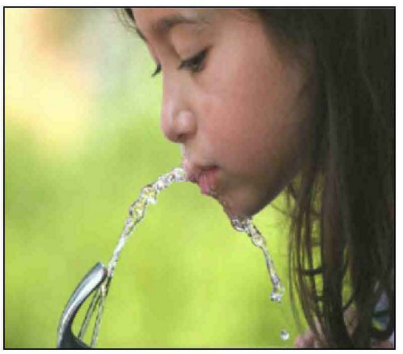
EPA Actions– Research/Reports

- **Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources – Office of Research and Development (ORD)**
  - Congressionally directed study
  - Focus on hydraulic fracturing water life cycle
  - Purpose:
    - To assess whether hydraulic fracturing can impact drinking water resources.
    - To identify driving factors that affect the severity and frequency of any impacts.
  - Analysis of existing data, case studies, laboratory studies, scenario evaluations and toxicological assessments
  - Results
    - Progress Report for public/SAB review - December 2012
    - Report of results - 2014



EPA Actions– Research/Reports (con't)

- **Technical workgroup on induced seismicity**

- **Site specific investigations of groundwater contamination complaints: Pavillion**

  - **Sampling Results**
    - **4**2 private drinking water and 4 stock wells were sampled
    - ATSDR recommended that affected residents use alternate water/ventilation due to high methane
  - **Monitoring Results**
    - Elevated pH, chloride, potassium, synthetic organic compounds (i.e., glycols, alcohols, etc.), methane, BTEX, DRO, and phenols
  - **Response**
    - Draft report released December 2011
    - March 2012 EPA/State/USGS/Tribal collaboration on new round of sampling

- **Site specific investigations of groundwater contamination complaints: Dimock**

EPA Actions - Energy Extraction Initiative

March 2010 EPA announced new **enforcement initiative** for energy extraction

First focus area is **onshore gas production**

Two major goals:

- Take action where violations cause **air or water impacts that threaten human health**
- **Ensure companies implement practices across operations**

EPA Actions - EPA Enforcement – Results

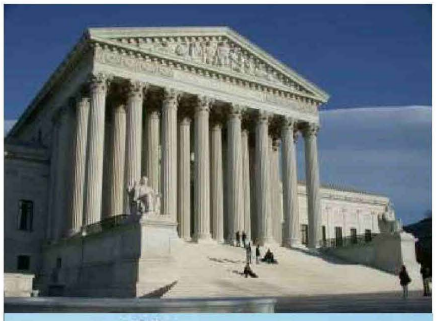
Examples:

Air reductions of about 2,300 tons per year (TPY) of NOx, 1,600 TPY of CO, and 3,600 TPY of VOCs, and **conservation of 22.65 million m^3 of CH_4** from 10 concluded enforcement actions

About 20 orders to address **brine spills**

Emergency orders to address **contamination of drinking water aquifers with contaminants** (including CH_4) from gas and oil operations???

Orders to **restore wetlands illegally filled** to create access roads to well pads



Conclusion

We must develop our domestic resources safely, responsibly, and efficiently.

President Barack Obama, *Blueprint for a Secure Energy Future*, March 30, 2011 (http://www.whitehouse.gov/sites/default/files/blueprint_secure_energy_future.pdf)

United States Environmental Protection Agency

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