

# Hydraulic Fracturing Policy

US EPA Office of Groundwater & Drinking Water  
January 25, 2011



# The New York Times

Editorial

September 20, 2010

**“The Environmental Protection Agency is about to begin a much-needed study of the health and environmental effects of extracting natural gas through hydraulic fracturing. The issue isn’t whether the country should keep drilling for natural gas, which is vital to our energy future. It is whether it can be done this way safely... Nationwide, hydraulic fracturing has been implicated in dozens of water pollution cases, but much of the evidence is anecdotal. The E.P.A.’s job is to figure out the risks, order changes in drilling practices where necessary and develop federal regulations to replace the present state-by-state patchwork of laws. The drilling industry says its technology is fundamentally sound. BP said pretty much the same thing. We need more credible assurances this time.”**

# Hydraulic Fracturing

## Agency Activities

- ▶ **Conduct new EPA study**
- ▶ **Communicate existing environmental authorities**
- ▶ **Clarify applicability of regulations**
- ▶ **Work with federal partners**
- ▶ **Implement Compliance and Enforcement Strategy**
- ▶ **Respond to Congressional and media requests**

# 2010 Hydraulic Fracturing Study

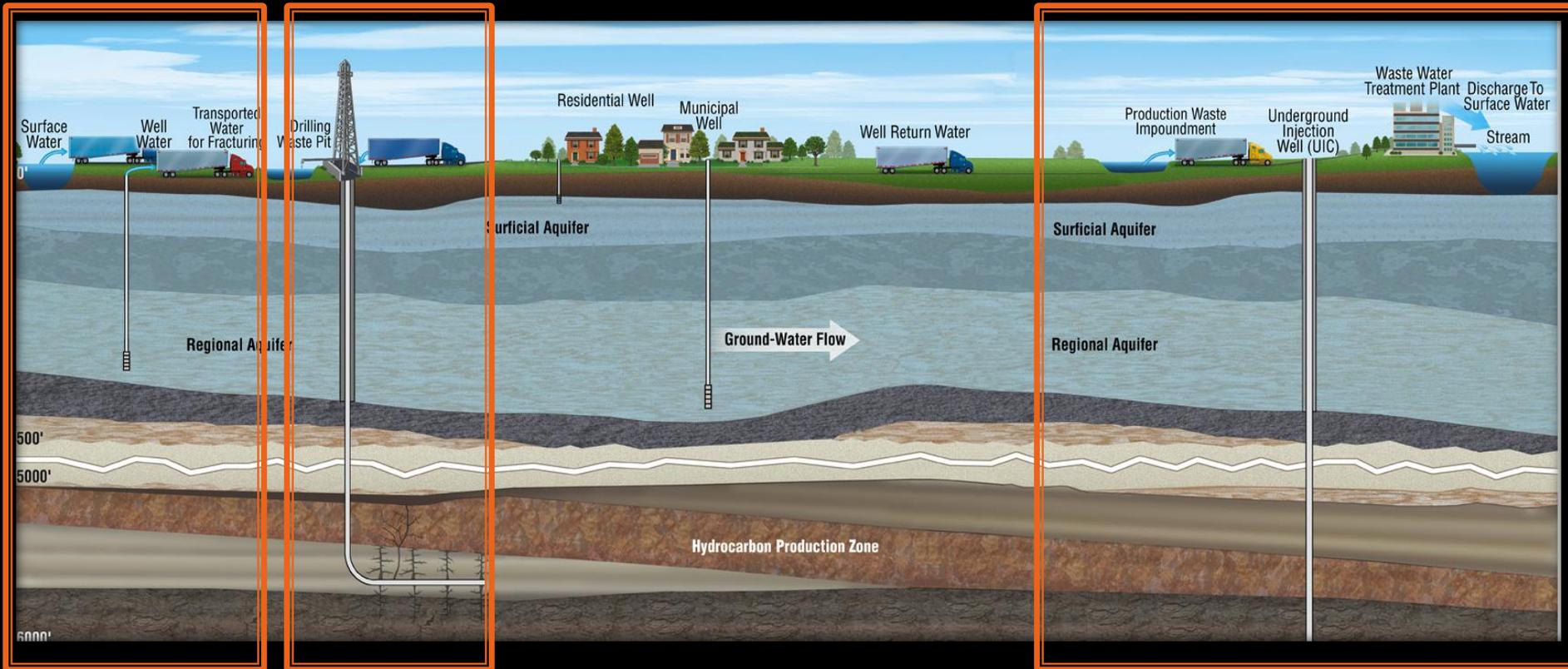
- »» Why is EPA conducting a study?
  - Public Concerns
  - Stakeholder Input
  - Study Timeline

# Hydraulic Fracturing Study

- ▶ Shale gas extraction has increased and has an expanded geographical reach
- ▶ The public and Congress have raised questions about the impact on drinking water
- ▶ EPA takes these inquiries seriously and has several water related initiatives underway

# Congressional Request

- ▶ In its FY2010 Appropriations Committee Conference Report, Congress requested EPA to study the relationship
  - Best available science
  - Independent sources of information
  - Transparent, peer-reviewed process
  - Consultation with others



Site Preparation Well Construction

Disposal of Fluids

# Hydraulic Fracturing Lifecycle >>

The HF lifecycle includes the cradle-to-grave processes necessary before hydraulic fracturing begins, well stimulation, and the management and disposal of fluids and wastes.

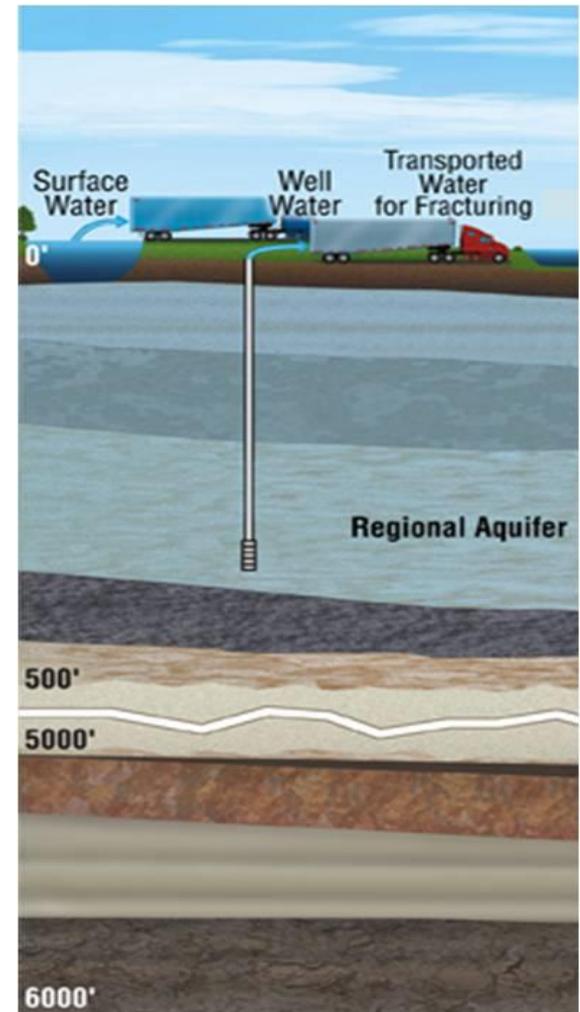
# Public Meetings on EPA's Study of Hydraulic Fracturing

Location	Speakers	Attendees
Fort Worth, TX	83	463
Denver, CO	48	159
Canonsburg, PA	94	967
Binghamton, NY	454	1215

# Public Concerns

- ▶ Sustainability of water resources
  - Water for HF come from public water sources, or directly from ground or surface waters
  - 250,000 – 6 million gallons per well may be used depending on site

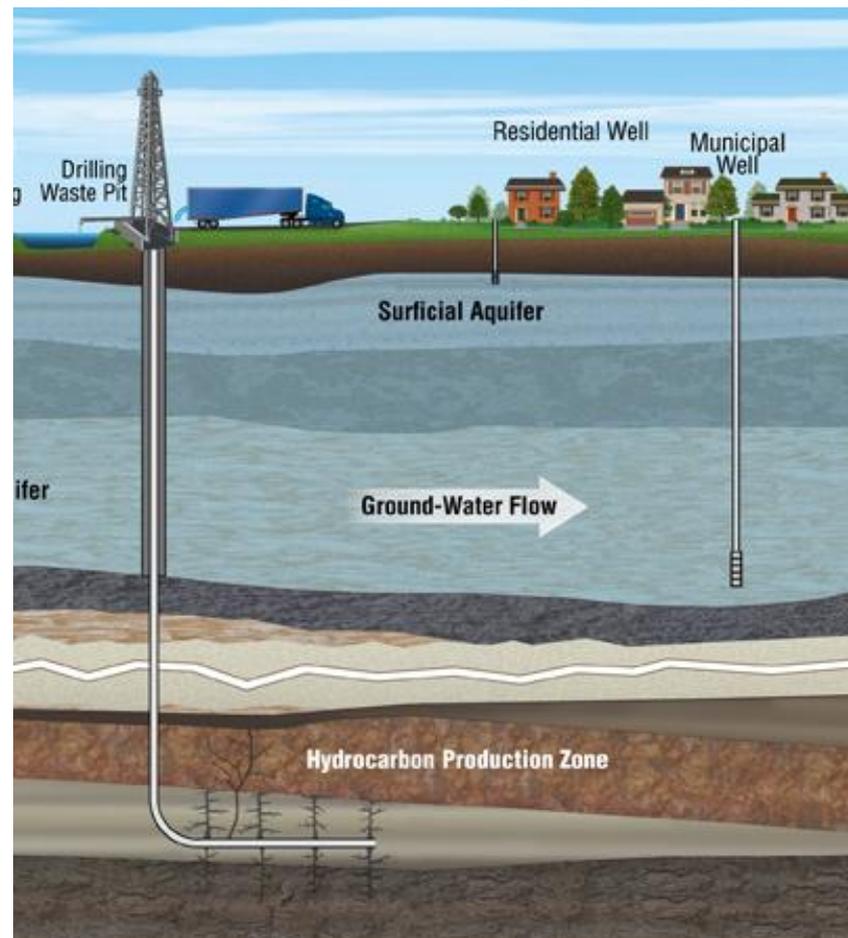
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# Public Concerns

- Well construction
- Landscape disturbance
- Air emissions
- Fracturing fluids
- Waste storage
- Decreased groundwater quality
- Increased traffic on low capacity roads

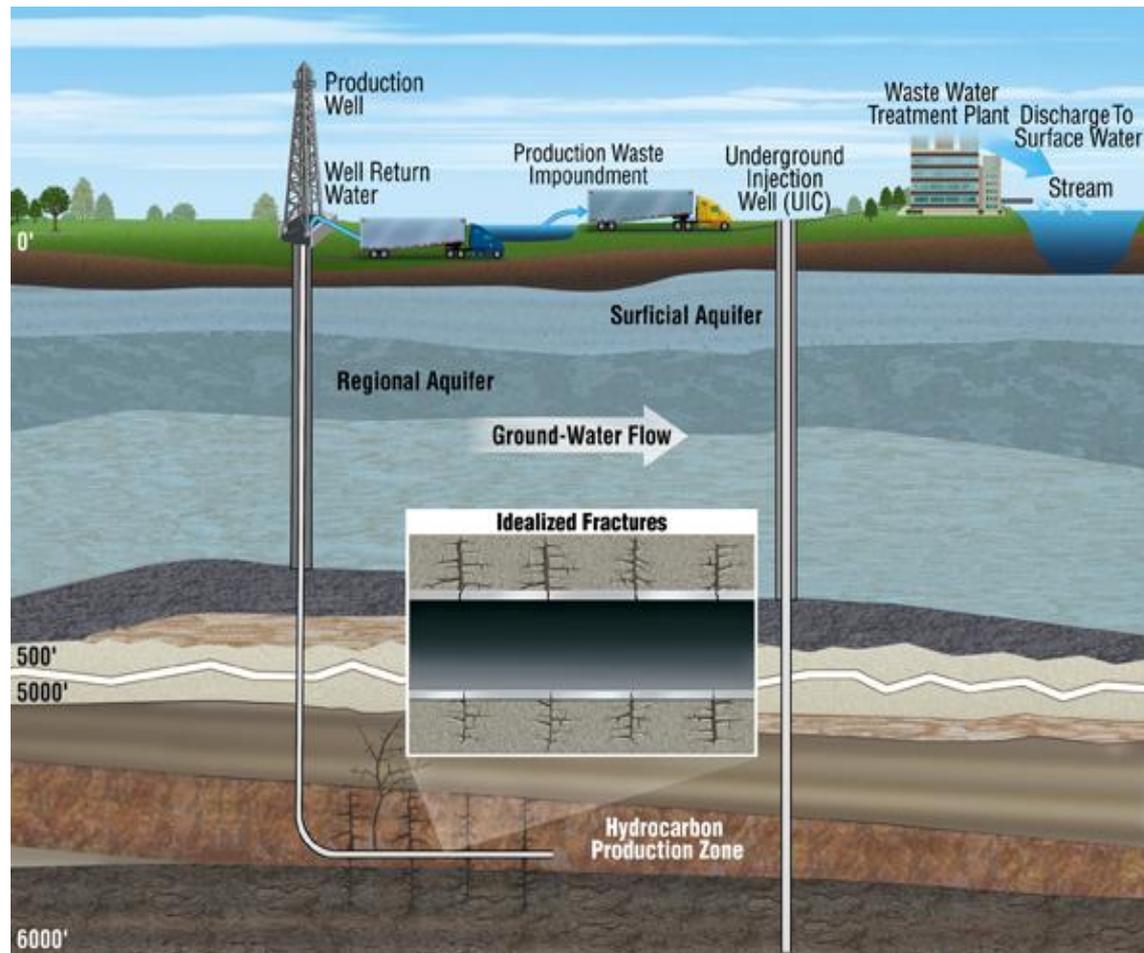
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# Public Concerns

- ▶ Fluid and mud disposal
- ▶ Surface discharge
  - Evaporation ponds
  - Downstream PWS
  - POTWs accepting wastes

Not to scale



# Stakeholder Input from Public Meetings

- What should be our highest priorities?
- Where are the gaps in current knowledge?
- Are there data and information we should know about?
- Where do you recommend we conduct our case studies?

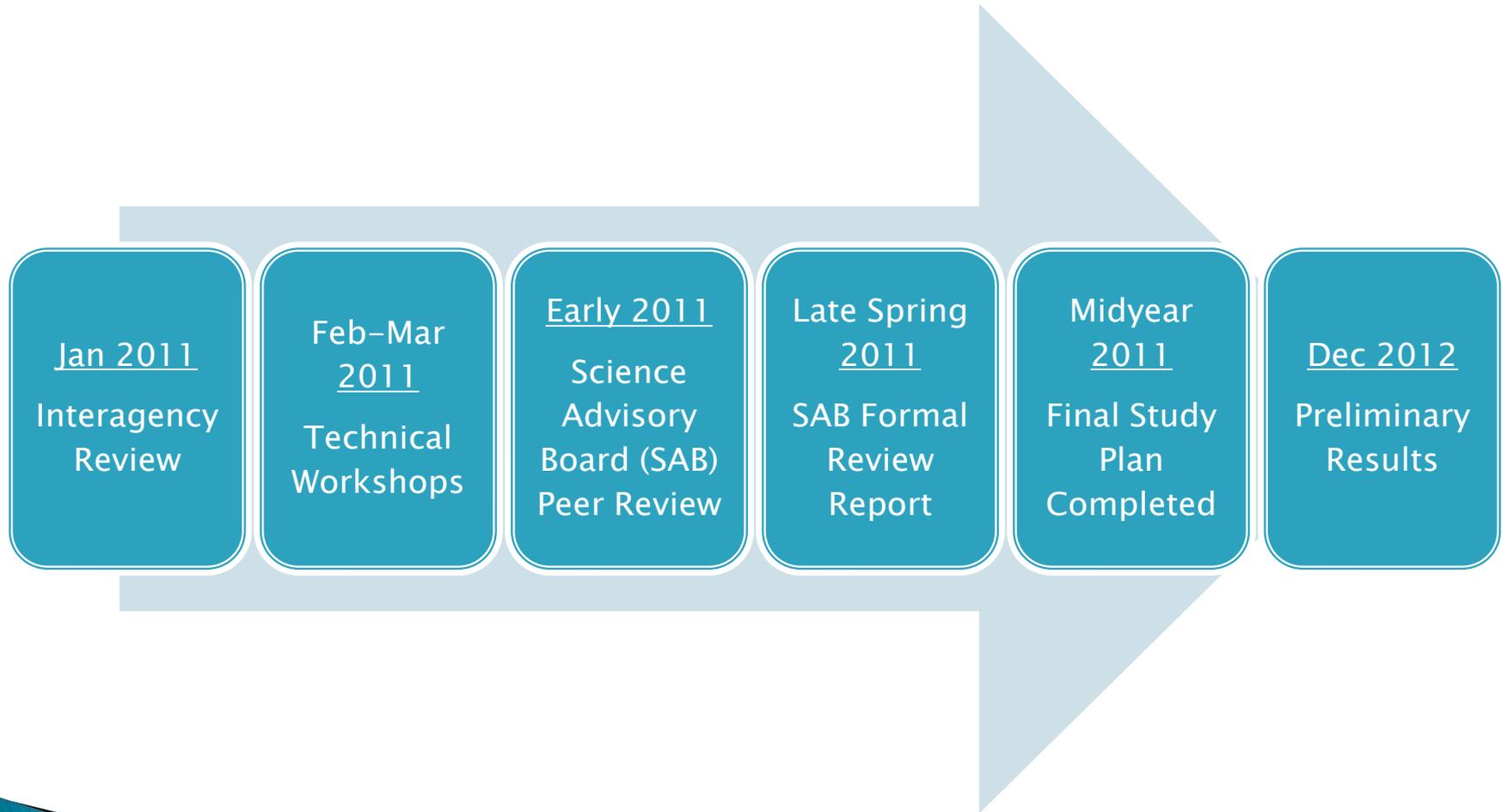
# What Did We Hear?

- ▶ Focus on water
- ▶ Focus on air and other impacts
- ▶ Conduct a comprehensive analysis
- ▶ Conduct a narrow analysis
- ▶ Study cumulative impacts
- ▶ Study chemical composition of chemical compounds, flowback, and produced water
- ▶ Study water use
- ▶ Conduct case studies

# Hydraulic Fracturing Information Request

- ▶ On September 9, 2010, EPA issued voluntary information requests to nine leading national and regional hydraulic fracturing service providers. The information requested is integral to ORD's study.
  - chemical composition of fluids
  - data on the impacts of the chemicals on human health and the environment
  - standard operating procedures
  - locations of sites where fracturing has been conducted

# Timeline for EPA Study of HF and Drinking Water



# HF Study Technical Workshops

- ▶ Feb–March 2011
- ▶ Workshop Themes
  - Chemical and Analytical Methods
  - Well Construction and Operations
  - Fate and Transport
  - Water Resource Management
- ▶ Focused discussions on topics relevant to HF will inform EPA scientists on the state of the art



# EPA's Statutory Framework to Protect Water



- Safe Drinking Water Act
- Clean Water Act
- Other Activities



# Federal Water Authorities Applicable to Hydraulic Fracturing

## Safe Drinking Water Act

- ▶ Underground Injection Control Program regulations
  - Hydraulic fracturing (HF) with diesel
  - Produced water/flowback injection

## Clean Water Act

- ▶ Water quality criteria and standards
- ▶ Effluent Limitation Guidelines (ELG)
- ▶ NPDES Permitting

# EPA Drinking Water Program Focus

- ▶ Ensure high quality water is available to provide for drinking water needs
- ▶ Prevent contamination and preserve existing sources of drinking water
- ▶ Provide safe drinking water to those served by public water systems

# Safe Drinking Water Act

- ▶ EPA's central authority to protect drinking water is drawn from the Safe Drinking Water Act (SDWA)
- ▶ The SDWA requires EPA to set legal limits on the levels of certain contaminants in drinking water
- ▶ The SDWA also requires EPA to protect underground sources of drinking water (USDWs) from contamination caused by underground injection
  - 1421 provides minimum standards for underground injection
  - 1422 provides for state primary enforcement authority
  - 1425 provides for alternative showing of effectiveness of program by state Underground Injection Control (UIC) Programs (Oil and Gas wells only)
- ▶ SDWA 1431 contains provisions to address imminent and substantial endangerment

# Underground Injection Control Program

- ▶ Currently, EPA regulates five classes of UIC well (Classes I – V)
- ▶ Class II wells inject fluids associated with oil and natural gas production including:
  - **Enhanced recovery** wells which inject fluid or gas to recover residual oil and gas after primary production has occurred
  - **Disposal** wells which inject fluids associated with oil and gas production or gas storage operations (including wells used to dispose of flowback from hydraulic fracturing)
  - **Hydrocarbon storage** wells which inject liquid hydrocarbons for storage, usually as part of the US Strategic Petroleum Reserve
  - **Hydraulic fracturing with diesel** in fracturing fluids or propping agents

# Use of Diesel for Hydraulic Fracturing under the SDWA

2005 Energy Policy Act amended SDWA §1421(d)(1)(B) to allow oversight of HF activities using diesel fuels

“The term underground injection excludes

- (i) the underground injection of natural gas for purposes of storage; and
- (ii) 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.”

# Clean Water Act

- ▶ National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States
- ▶ Water quality based limits for regulated entities (established in NPDES permits) are often required to ensure compliance with state water quality standards for protection of waters of the U.S.
- ▶ Effluent limitation guidelines establish a national, technology-based discharge requirement and are implemented through NPDES permits
  - Effluent guidelines for Oil & Gas extraction facilities apply to facilities engaged in exploration, drilling and production in offshore, coastal, and onshore areas

# NPDES Permits & Flowback Waters

- ▶ If flowback is not injected into Class II wells, it must, in most cases, be sent to Publicly Owned Treatment Works (POTWs).
- ▶ In states where POTWs accept these flowback waters, dischargers must notify the permitting authority of this.
  - Note that chlorides in flowback water are not well treated by POTW treatment systems; in fact, additional treatment by the discharger to remove chlorides from these waters is needed prior to disposal at a POTW.
- ▶ For water users downstream, note that neither the CWA nor NPDES regulations require notification of downstream users by POTWs that treat and discharge these flowback waters

# Other EPA Activities

- ▶ **Air:** reviewing four existing air rules related to natural gas including processing, transmission, storage, and distribution
  - Proposal due 1/31/11
- ▶ **Enforcement:** Energy Extraction Initiative to focus on natural gas
  - 2011–2013
  - Proposal due 1/31/11
- ▶ **Coordination:**
  - DOE and other Federal Agencies
  - Liaison group of state associations formed to interact with EPA on HF study (IOGCC, GWPC, ASDWA, ASIWPCA, ECOS)

# Hydraulic Fracturing

## Key Observations

- ▶ Natural gas is a critical source of energy
- ▶ EPA is aware of health and environmental concerns and takes these concerns seriously
- ▶ Natural gas exploration must be done in a manner that is protective of human health and the environment

# Hydraulic Fracturing

## Key Observations

- ▶ Find a balance between the need to respect State diversity and consistency
- ▶ Challenge is to shift from being reactive to proactive
- ▶ Clear, transparent communication is critical
- ▶ Knowledge transfer is critical

# Hydraulic Fracturing: Information

## Science Advisory Board Website

- The next opportunities for public comment on the HF Study will be part of the peer review process
- Website: [www.epa.gov/sab](http://www.epa.gov/sab)

## ORD Docket for HF Study

- The docket for the HF Study contains public comments received during the 2010 stakeholder events
- <Website>

## EPA Hydraulic Fracturing Website

- Study: [www.epa.gov/hydraulicfracturing](http://www.epa.gov/hydraulicfracturing)
- Meetings and Outreach:  
[http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells\\_hydroout.cfm](http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_hydroout.cfm)

# Questions, Comments?