

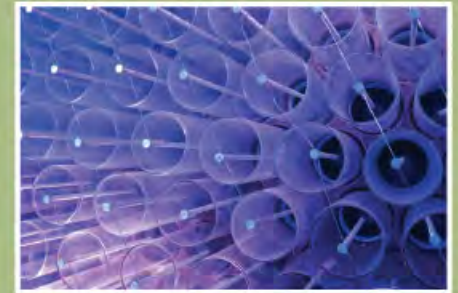


PENNSYLVANIA  
AMERICAN WATER

# Water Management Planning Shale Gas/Oil Development

April 25, 2013

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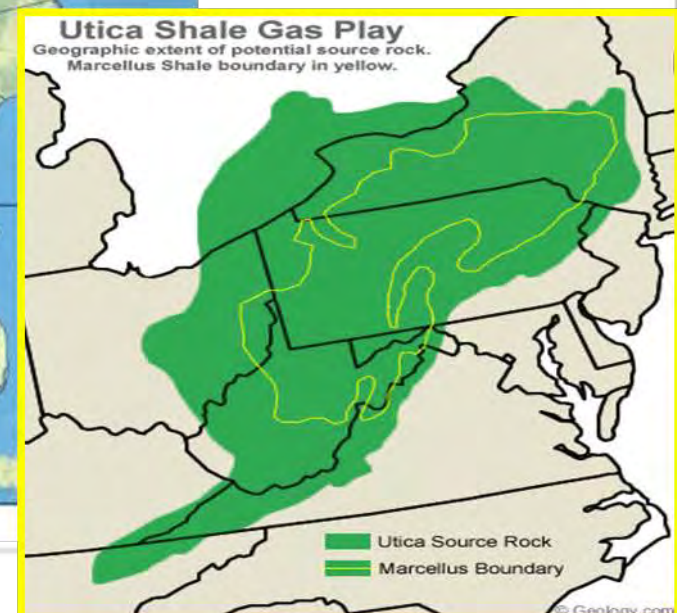
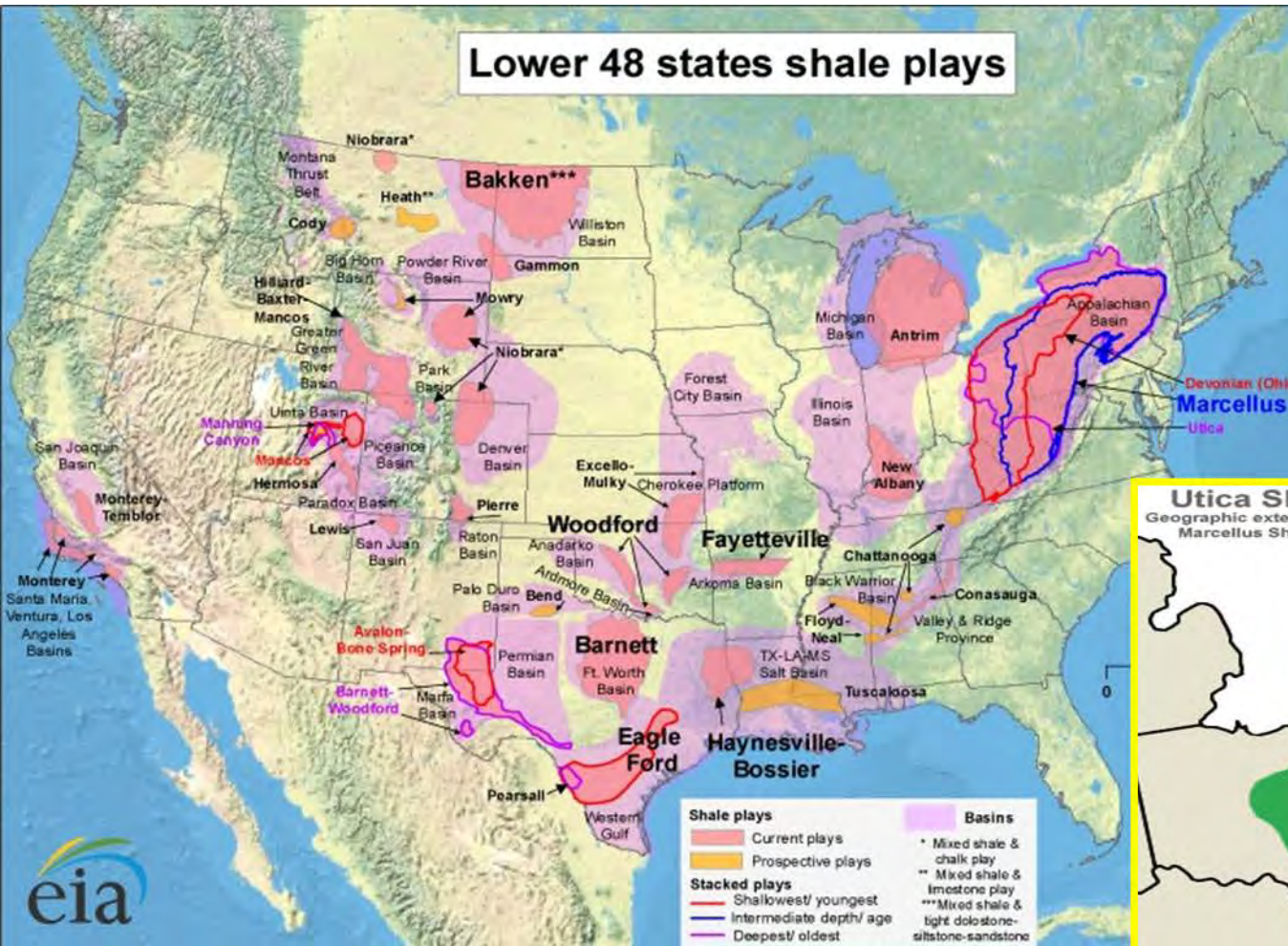
## Our Company

- **Subsidiary of American Water Works Co., Inc.**
- **Roots date back to early 1800s, Incorporated in 1904**
- **Largest regulated water and wastewater service provider in PA**
- **Serving approximately 2.2 million people in 36 counties**
- **More than 1,000 employees**
- **Customer base:**
  - 640,000 water customers
    - 92% residential
    - 7% commercial
    - 1% industrial/other
  - 17,000 wastewater customers





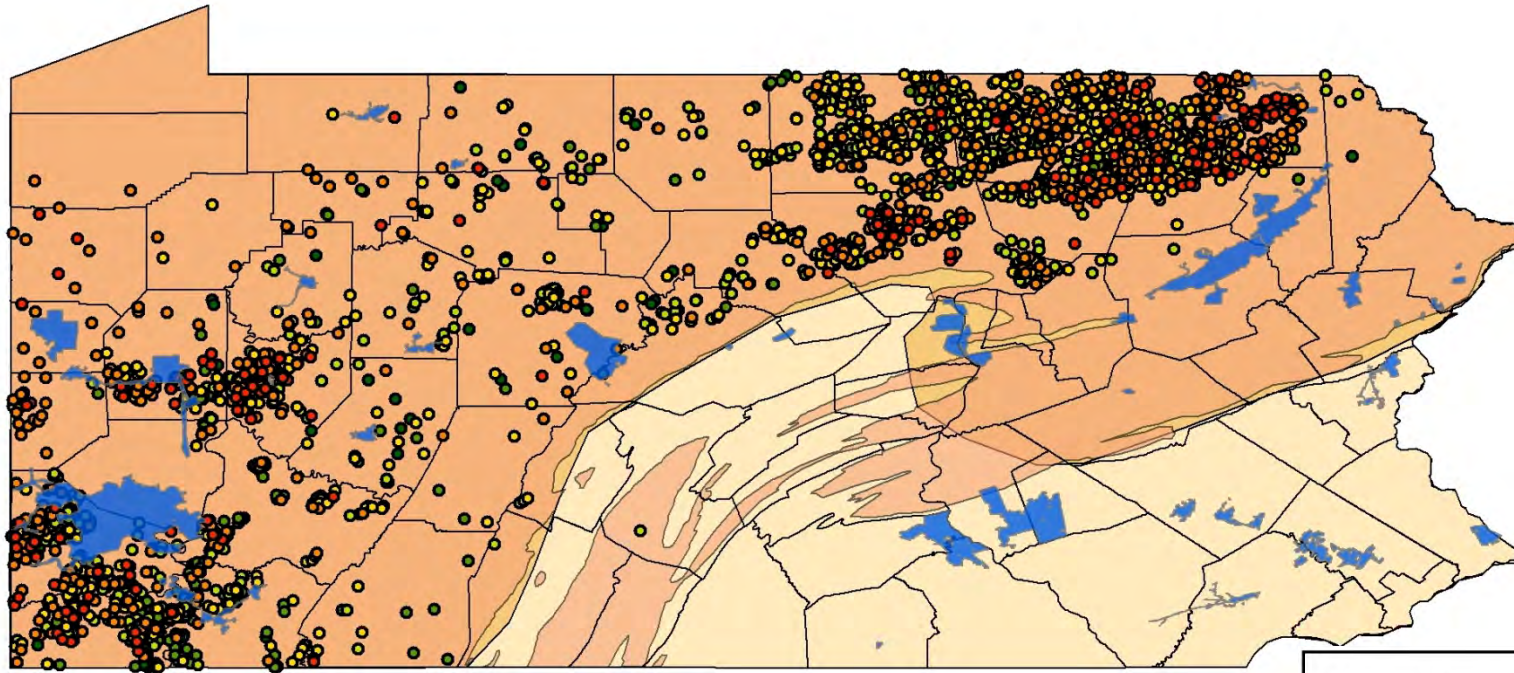
# Shale Development In the Northeastern United States



Source: Energy Information Administration based on data from various published studies. Updated: May 9, 2011



# Unconventional Gas Well Development in Pennsylvania



## Legend

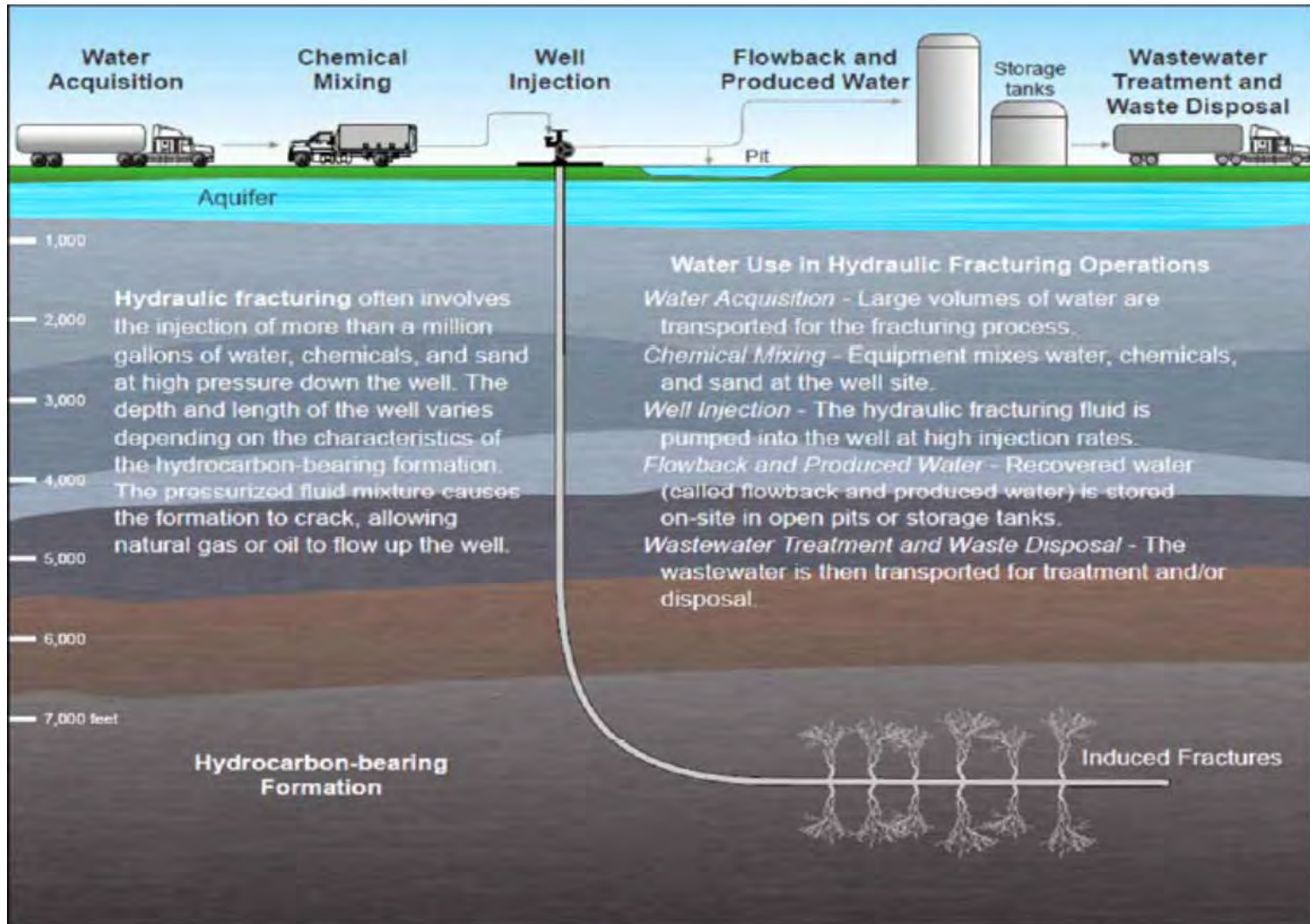
PA AWK Service Area

## SpudReport

### Year

- 2013 (375 Wells through 4/23)
- 2012 (1263 Wells)
- 2011 (1975 Wells)
- 2010 (1614 Wells)
- 2009 (815 Wells)
- 2008 (333 Wells)

# Hydraulic Fracturing Overview





## Water Usage - Unconventional Gas Well Development

### Typical Drilling Rig

- Preparation of drilling fluids requires 100-200,000 gallons per well
- During “completions” or hydraulic fracturing, needs vary by company and well, typically between 3 MG and 6 MG per well in total
- Generally, approximately 20-25% of the water used to complete a well is recycled (treated) flowback water from a nearby well
- Energy companies must track and report water usages





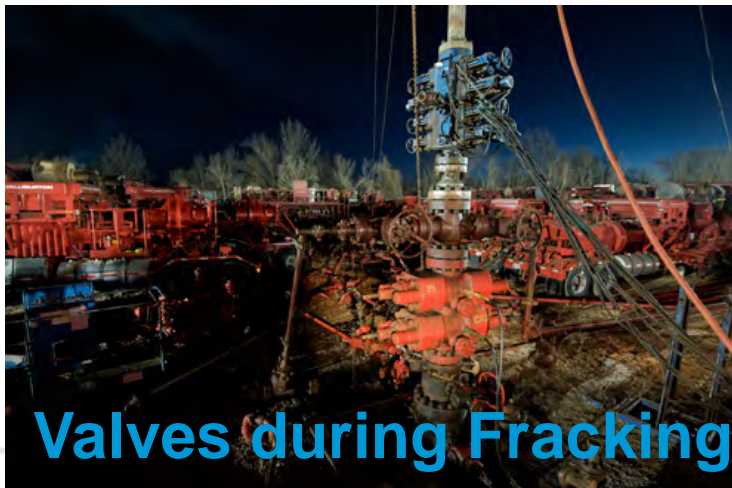
## Water Type and Quality Needs

- **Ground Water**
  - Wells and springs
- **Surface Water**
  - Ponds
  - Lakes
  - Streams
  - Rivers
- **Public Water Supplies**

### Well Site during Fracking



- Suspended solids ~ < 10
- Dissolved Solids - varies
- Low relatively iron, barium, sulfates and chlorides quantities
- Water for drilling fluids usually requires higher quality



**Valves during Fracking**



## The “Water Management Plan” (WMP)

- **Energy companies must have all water sources to be used in gas well development approved**
  - Pennsylvania Department Of Environmental Protection (PA DEP)
  - Susquehanna River Basin Commission (SRBC) central PA
  - Delaware River Basin Commission (DRBC) eastern PA
- **Managed through PA DEP Bureau of Oil and Gas (BO&G)**
- **Energy developing company files a water management plan application (PWS does not need to supply separate WMP)**
- **BO&G reviews for completeness and coordinates with PA DEP Bureau of Safe Drinking Water (BSDW) to complete review**
- **BSDW at Regional Office may contact the Public Water Supplier with questions or for clarity**
- **BO&G coordinates the correspondence with Energy Company including WMP Approval letter**



## Best Practices When a PWS Serves Shale Development

- Modeling and field testing to ensure adequate supply and pressure is available
- Work within PA DEP Allocation permits and SRBC and DRBC docket limits
- Document conditions of commitment to supply water to energy company
- Do not over extend water systems capability



## Best Practices (continued)



- **Make the “commitment to supply” to energy companies an interruptible supply during times of water system stress (fires, main breaks, droughts)**
- **Standardized connections with backflow prevention**
- **Do not use hydrants**
- **Documents operating protocols**
- **Communication/coordination plan with energy companies**



## What PA DEP BWS review when PWS supply is involved

- Volume and rate of withdraw will not adversely impact water quality or quantity available to other permanent users
- Ensuring all necessary permits are obtained
- Cross connection/backflow prevention is meets drinking water standards
- Security of connection is provided to prevent unauthorized access (intentional or unintentional )
- Ensuring compliance with all SDWA and Water Allocation permit conditions
- Water loading instructions supplied, control, monitoring record keeping plan
- Specific bulk sales agreements are in place as applicable
- Bulk loading stations require a separate permit



## In Summary

- **Energy companies need to have proper approvals to use water from public water systems**
  - PA DEP and /or SRBC or DRBC
- **Use best practices in order to assess system's water availability**
- **Have good security and operational control plans in place**
- **Recommend that supply is interruptible under water system stress**
- **Document “commitment to supply” to energy company**
- **Do not use hydrants for supply connections**





# Questions?