



Hydraulic Fracturing: Implications for Local Water Resources

Christopher Gabelich
OCWD/MWDOC Board Meeting
July 31, 2013

Summary of Issues

Energy

- Cheap, Clean, and Domestic Supply
- Bridge Fuel
- Economic Stimulus

Public

- Local Impacts
- Lack of Disclosure
- Potential Health Effects

Hydraulic Fracturing

Government

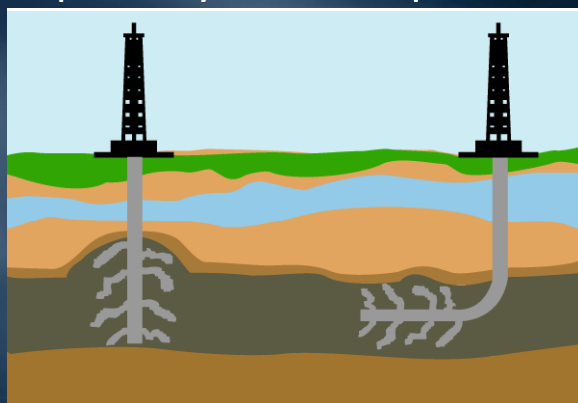
- Federal Exemptions
- Who's to Govern?
- What to Govern?

Environment

- Air
- Groundwater
- Surface Water
- Land

Hydraulic Fracturing or “Fracking”

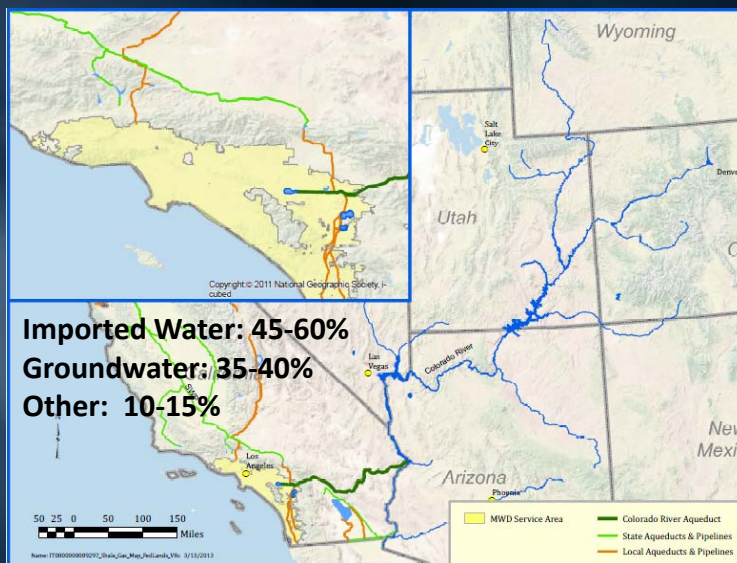
The use of pressurized fluids to create fractures in rock, allowing for the extraction of oil and natural gas from previously unusable deposits



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Southern California’s Water Supply



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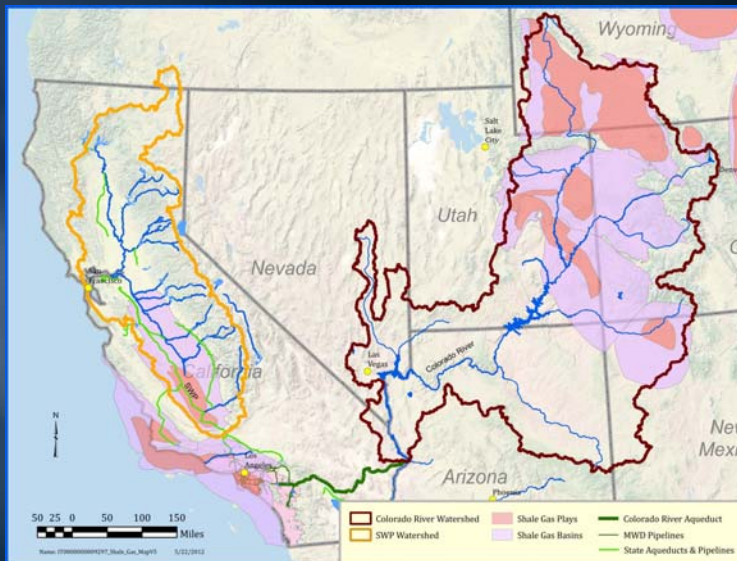
Southern California's Water Supply



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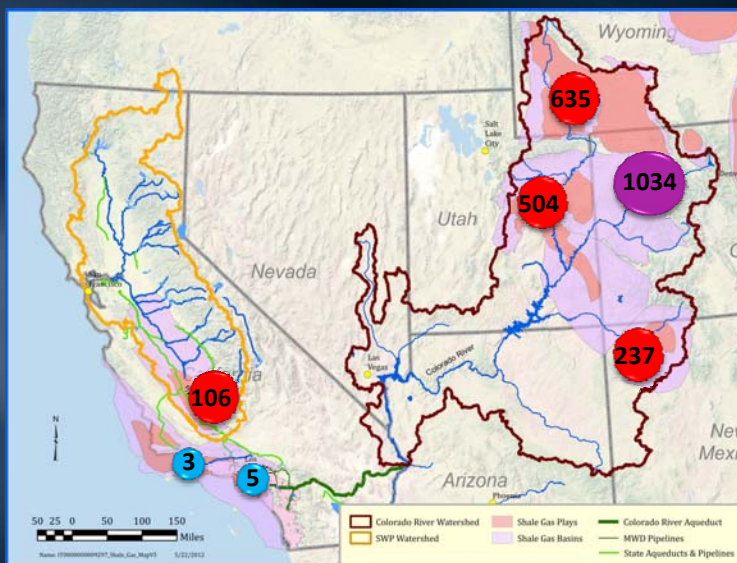
Where is Fracturing Used?



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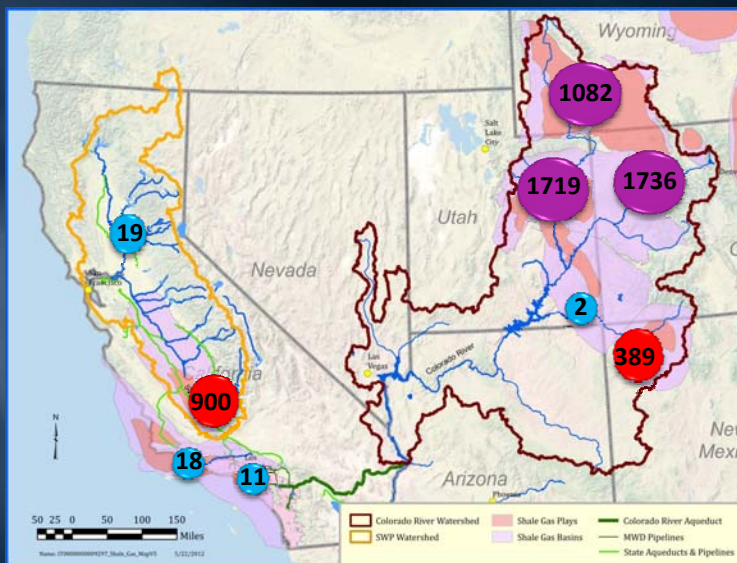


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Source: Fracfocus.org/ Accessed May 22, 2012

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Where is Fracturing Used?

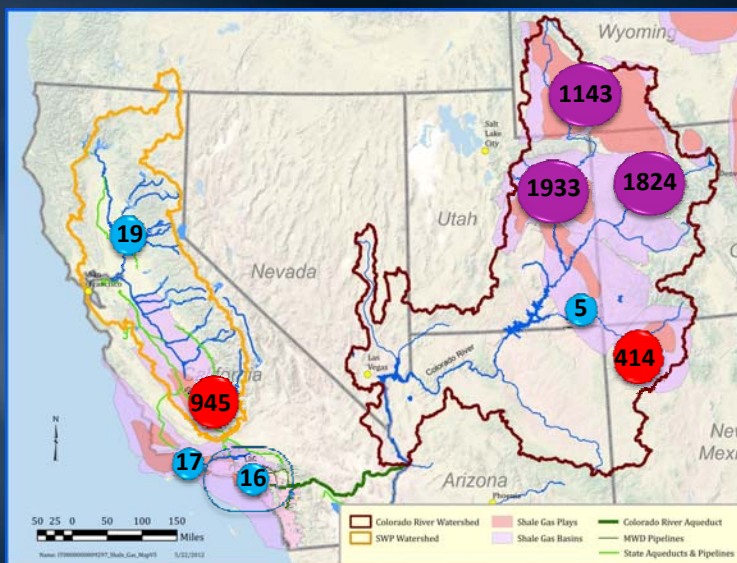


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Source: FracFocus.org/ Accessed May 23, 2013

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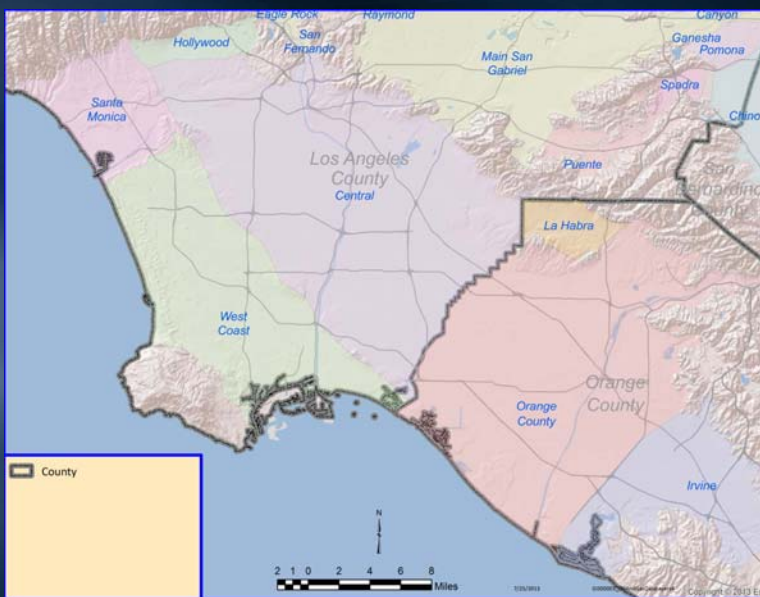


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Source: FracFocus.org/ Accessed July 25, 2013

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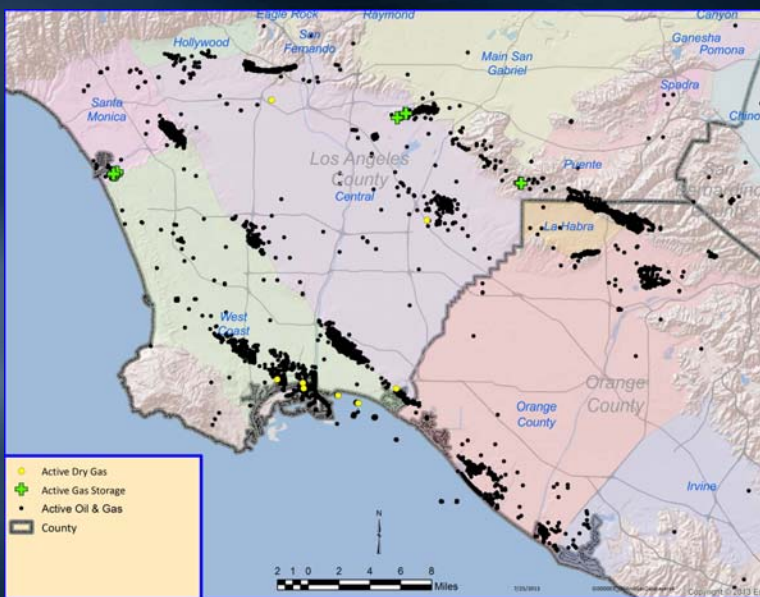
Los Angeles and Orange Counties



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Los Angeles and Orange Counties

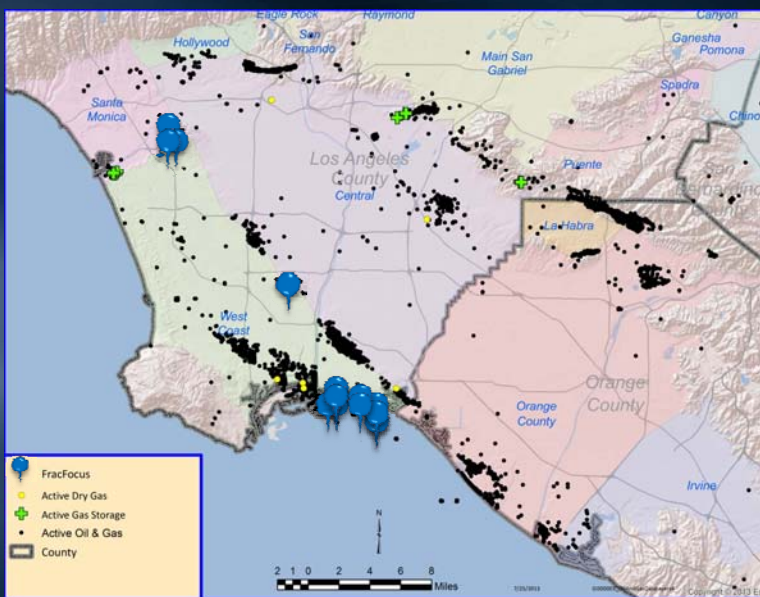


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Data as of July 25, 2013

July 31, 2013

Los Angeles and Orange Counties

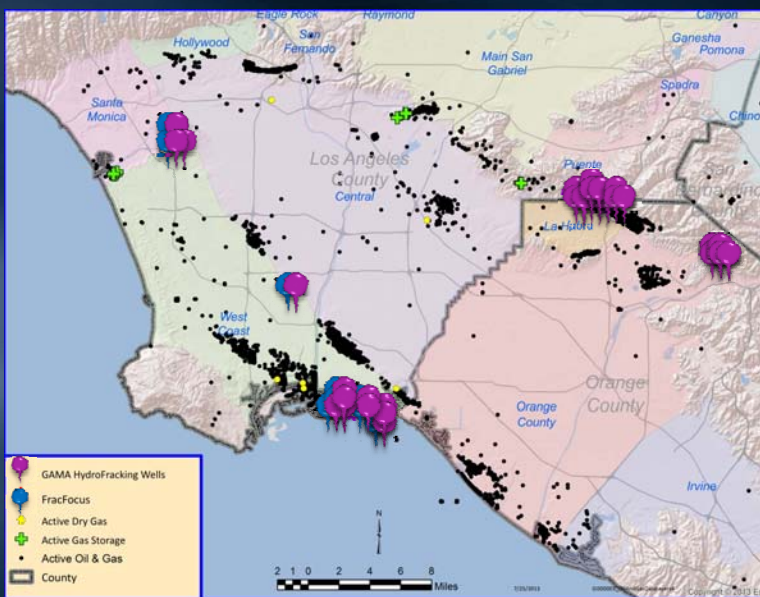


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Los Angeles and Orange Counties



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The Crux of the Matter

“Oil and gas development is an industrial activity, and like all industrial activities, it carries some degree of risk”

Water and Hydraulic Fracturing:
A White Paper... AWWA, 2013

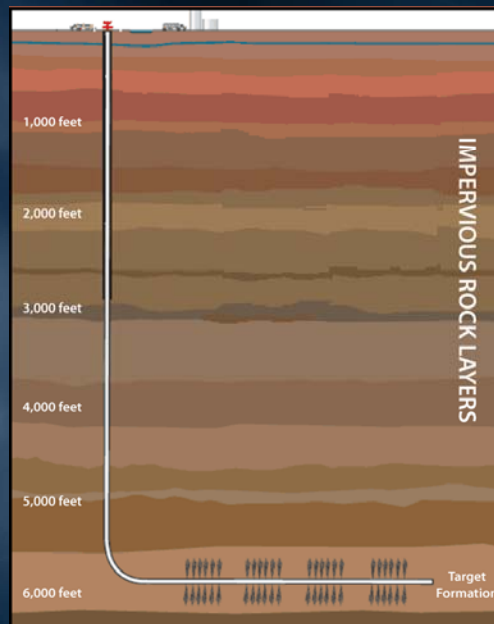


Photo of Marcellus shale gas extraction well pad and farm in Pennsylvania.
Source: <http://Science.NBCnews.com>

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Hydraulic Fracturing



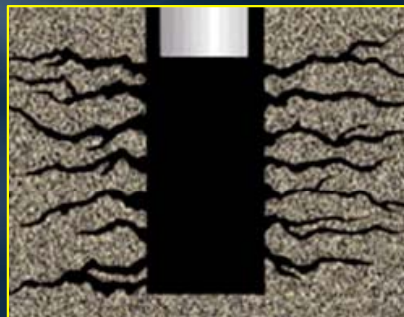
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Acid Stimulation

The use of concentrated acids to stimulate the extraction of hydrocarbons from carbonate, quartzite, or sandstone formations

- Acids used
 - Hydrochloric acid
 - Hydrofluoric acid
- Variants include
 - Matrix acid stimulation
 - Fracture acid stimulation
- Recently added to SB 4
- Potentially used in Monterey Shale

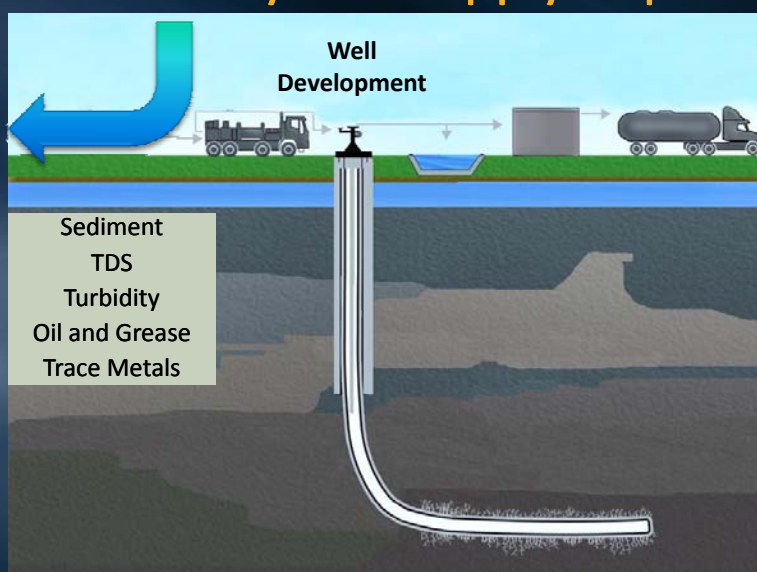


Source: MPG Petroleum

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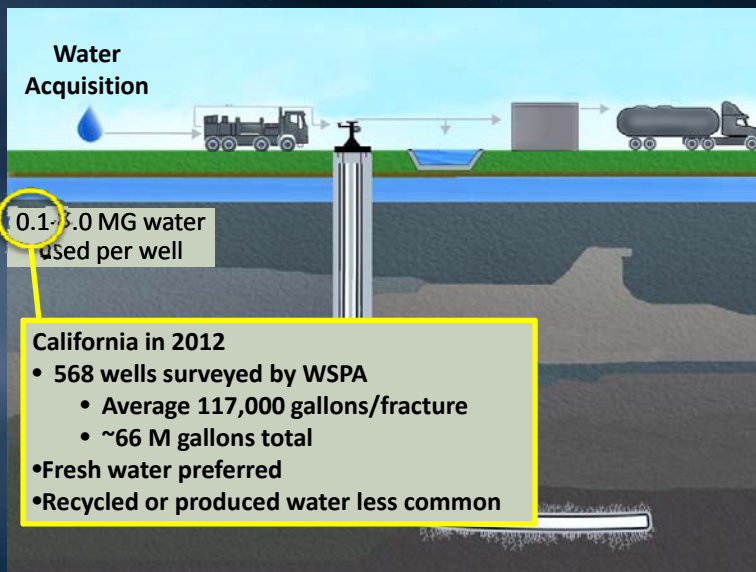
Water Quality and Supply Impacts



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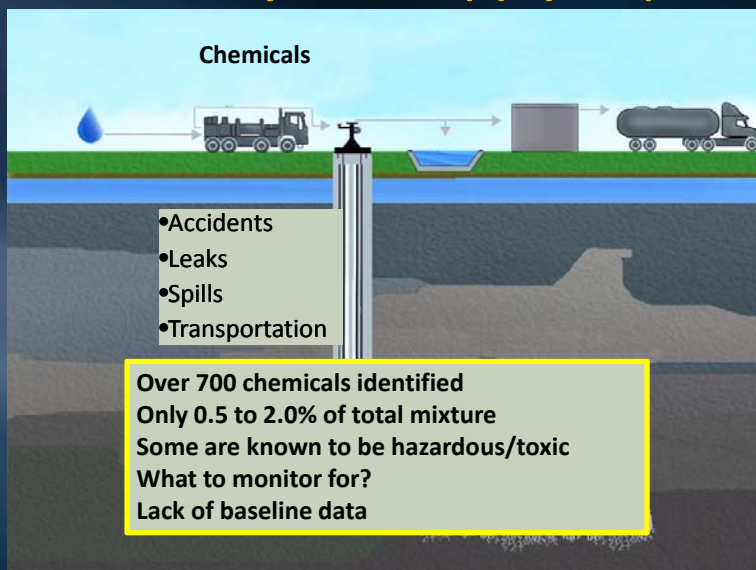
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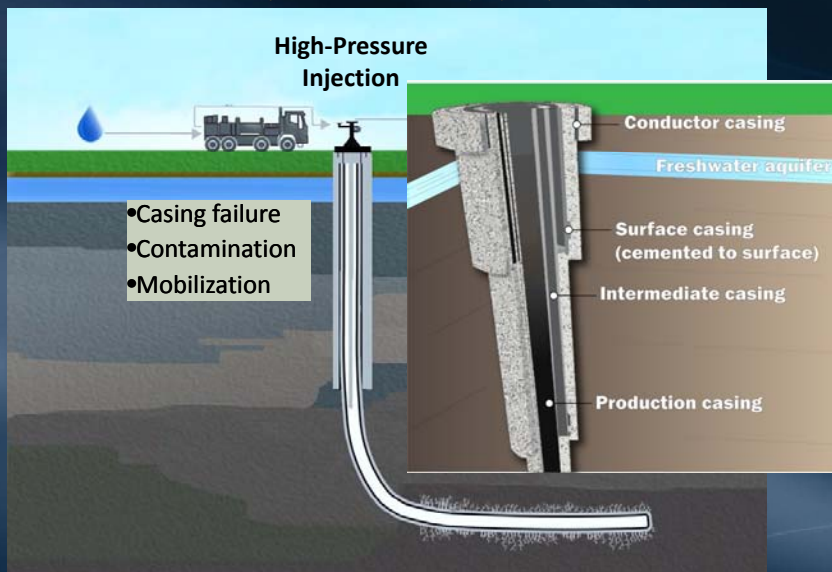
Water Quality and Supply Impacts



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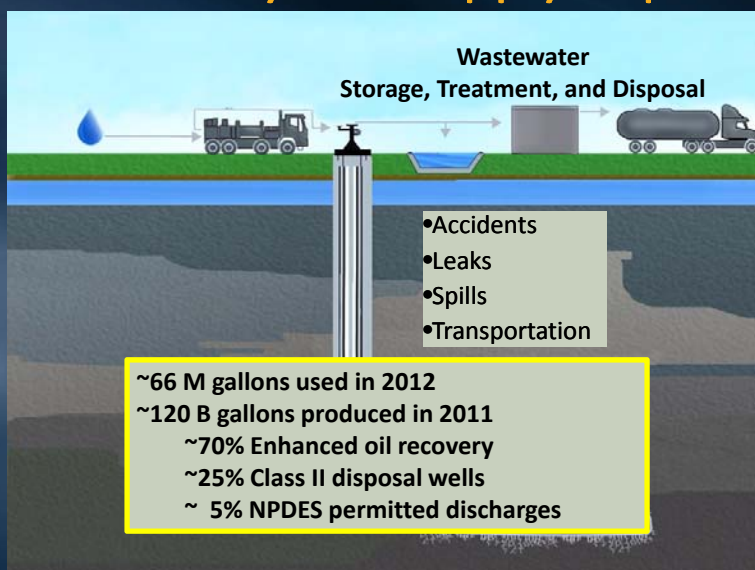
Water Quality and Supply Impacts



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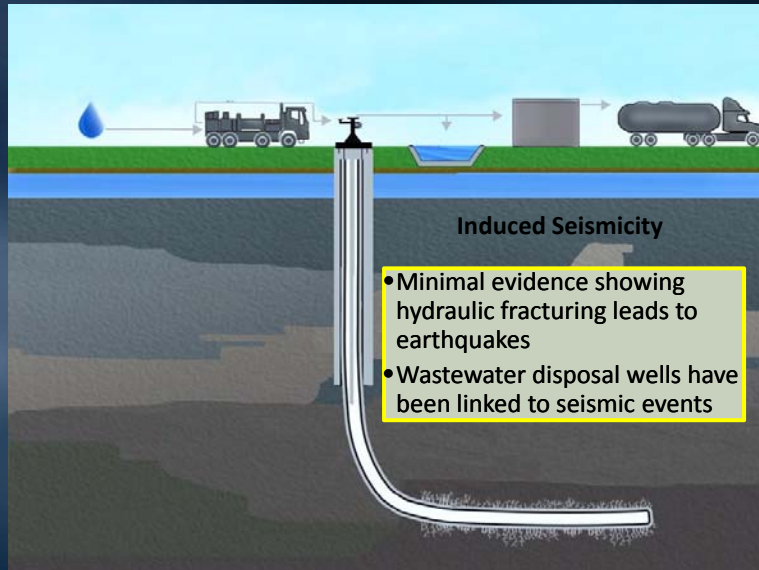
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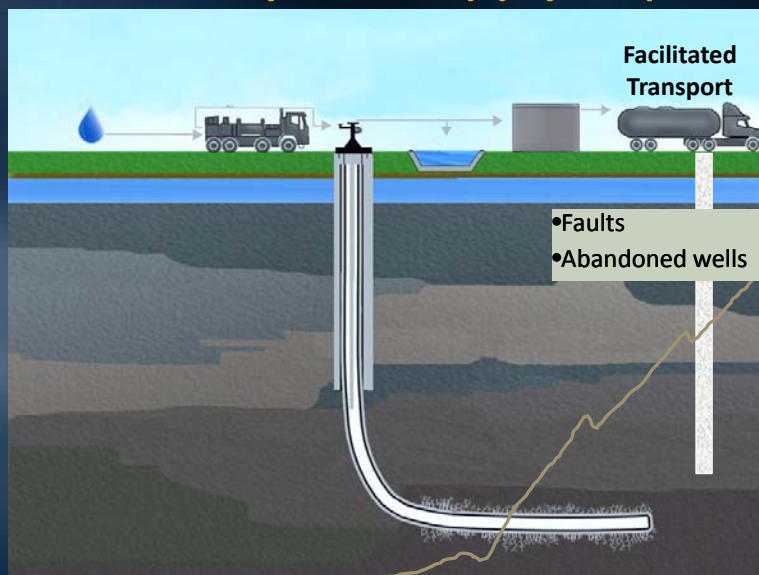
Water Quality and Supply Impacts



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Water Quality and Supply Impacts



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Moving Forward –Federal Actions

- US Environmental Protection Agency
 - “Green completion” to capture fugitive air emissions (VOCs, methane, etc.)
 - Adopted April 18, 2012 under Clean Air Act
- US Department of Interior
 - Revised draft released May 11, 2013
 - Applies to all federal and tribal lands
 - **Well-bore integrity**
 - **Disclosure of chemicals**
 - **Management of flowback and produced water**
 - Public comment period extended to Aug. 23, 2013

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Moving Forward –Federal Actions (Cont)

- Four federal bills introduced
 - H.R. 1921 (DeGette and Gibson) & S. 332 (Sanders and Boxer)
 - Repeal Safe Drinking Water Act exemption
 - Disclose hydraulic fracturing chemicals
 - H.R. 1154 (Polis)
 - Repeal Clean Air Act exemption for aggregation of emissions from oil and gas sources
 - Add hydrogen sulfide as hazardous air pollutant
 - H.R. 1175 (Cartwright)
 - Study stormwater impacts associated with oil or gas operations

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Moving Forward –State Actions

- South Coast Air Quality Management District
 - Rule 1148.2 adopted on April 5, 2013
- California Division of Oil, Gas, and Geothermal Resources (DOGGR)
 - Discussion Draft released December 17, 2012
 - Well construction and design criteria
 - Chemical and process disclosure
 - Pre- and post-monitoring
 - Public notification 10-days prior
 - Wastewater handling and disposal
 - Adoption by Summer 2014 (?)

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Moving Forward –State Actions (Cont)

- 14 bills introduced in 2013
 - Only 1 of 9 hydraulic fracturing bills remain
 - SB 4 (Pavley)— Well Stimulation
 - Permit 30-days prior
 - Public notification
 - Pre- and post fracking WQ monitoring upon request
 - Posts data on searchable web site
 - Other related bills
 - Policy of State to develop natural gas (AB 1257 Bocanegra)
 - CO₂ sequestration and enhanced production (SB 34 Calderon)
 - 9.9% severance tax (SB 241 Evans)
 - Well bonding requirements (SB 665 Wolk)
 - Reaffirms Uniform Trade Secrets Act (SB 802 Evans)

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Response to Public Inquiry

- Over 150 constituents routinely monitored
 - Many constituents (e.g., TDS, bromide, chloride, alkalinity, and benzene) serve as early warning indicators for potential contamination from oil and gas development activities
- Consumer Confidence Reports (CCRs) are publically available and mailed to consumers annually
 - Metropolitan's Annual Reports serve as the basis for many utilities' CCR imported water quality data

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Metropolitan's Board Policy

Advocate for the inclusion of source water protection provisions in energy development policies, legislation, and regulations. Covered energy development activities may include, but are not limited to, oil and gas extraction that use enhanced recovery techniques such as hydraulic fracturing

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Other Resources

- FracFocus.org
- Berkeley Law Study
 - “Regulation of Hydraulic Fracturing in California: A Wastewater and Water Quality Perspective”
- United States Environmental Protections Agency
- American Water Works Association
 - Water and Hydraulic Fracturing: A White Paper
- State Water Resources Control Board
 - Groundwater Ambient Monitoring and Assessment Program

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