

Mentoring Environment & Energy Together Webinar Session 3

Addressing Public Concerns Over Hydraulic Fracturing

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9:30 – 11:30 AM EST

Hosted by



About This Webinar

Recording Available

A recording of today's webinar will be made available in the coming days on The Horinko Group's website at <http://www.thehorinkogroup.org>.

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A PDF version of today's slideshow will also be made available on THG's website following the conclusion of today's webinar.

Today's Agenda

- 🌀 Welcome, Introductions, and Objectives
- 🌀 Featured Presentation
- 🌀 Question & Answer Discussion
- 🌀 Project Outline Discussion
- 🌀 Key Take-Aways and Next Steps

Meet Today's Featured Presenter



Darren Smith
Environmental Manager
Devon Energy Corporation

Addressing Public Concerns Over Hydraulic Fracturing



Darren Smith
Environmental Manager

Media and Public Attention

The Expression of Public Concern



GASLAND

**The
New York
Times**



Public Environmental Concern

These groups echo individual concerns about:

- Water Contamination
 - Spills
 - Methane Migration
 - Chemicals used in Hydraulic Fracturing
- Air Quality Issues
 - Flaring and Completion Emissions
 - Engine Emissions
 - Health impacts
- Crop and Livestock Failure
- Induced Seismic Activity

Public Environmental Concern

What do we know about Hydraulic Fracturing?

History of Hydraulic Fracturing

- **1947:** First well receives hydraulic fracturing treatment to stimulate natural gas development (Grant County, KS).
- **1980s/early 1990s:** George Mitchell successfully combines horizontal drilling with hydraulic fracturing to “crack the code” of the Barnett Shale in north Texas.
- **Today:** Hydraulic Fracturing has been used on over 1 million wells, and yet, Lisa Jackson, EPA Administrator, is “*Not aware of any proven case where the fracking process itself has affected water.*”



Evidence of Harm

What has the scientific literature found?

Scientific Studies - Water

Studies Concerning Water Contamination

- IOGCC, 2002 - 26 state study revealing no incidents of harm to groundwater in spite of the use of hydraulic fracturing for over 60 years.
- EPA, 2004 - Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs - hydraulic fracturing poses “*little to no risk of fracturing fluid contaminating underground sources of drinking water during hydraulic fracturing of coalbed methane production wells.*”
- UT, Austin, 2012 - Separating Fact From Fiction in Shale Gas Development - *Hydraulic fracturing of shale formations to extract natural gas has no direct connection to reports of groundwater contamination.*

Scientific Studies - Water

Studies Concerning Water Contamination

Continued

- GWPC, 2009 - State Oil and Gas Regulations Designed to Protect Water Resources - *the potential for hydraulic fracturing deep shale natural gas and oil wells to impact groundwater is “extremely remote.”*
- Penn State University, 2011 - *“analyses of post-drilling versus pre-drilling water chemistry did not suggest major influences from gas well drilling or hydrofracturing (fracking) on nearby water wells.”*
- MIT, 2011 - The Future of Natural Gas - *of the water contamination incidences reported from 2005-2009, none were related to hydraulic fracturing.*

Scientific Studies - Water

Studies Concerning Water Contamination

Continued

- EPA, 2012 - Dimock, PA - claims of water contamination retracted
- EPA, 2012 - Pavillion, WY - claims of water contamination retracted
- EPA, 2011, Parker County, TX and Range Resources - Imminent and Substantial Endangerment Order withdrawn. Facts could not implicate HF
- Duke, 2011 - 2 separate studies found no fracturing fluids in water wells, no correlation between brine migration and Marcellus Shale natural gas development.

Scientific Studies - Air

Studies Concerning Air Contamination

- ERG, 2011 City of Fort Worth Natural Gas Air Quality Study - “The ambient air monitoring data provide no evidence of 24-hour average concentrations reaching levels of health concern”
- Mickey Leland Urban Air Toxics Research Center, 2011 - “These concentrations are also much lower than those specified by the short- and long-term AMCVs (for example, 180 and 1.4 ppbv, respectively, for benzene).”
- TCEQ studies - Again no evidence of human health impacts. Hundreds of ambient air samples taken.
- TDSH - blood samples collected from residents of Dish, TX - no evidence of exposure.
- API/ANGA Study - EPA’s estimate of upstream oil and gas emissions is 100% too high.
- MIT Study - On emission from fracking “However, it is also clear is that the production of shale gas and specifically, the associated hydraulic fracturing operations have not materially altered the total GHG emissions from the natural gas sector.”

Scientific Studies - Seismicity

Studies Concerning Induced Seismicity

UK Geomechanical Study, 2011

- *“If these factors were to combine again in the future local geological limits seismic events to around magnitude 3 on the Richter scale as a worst-case scenario.”*
- *“Even the theoretical maximum seismic event of magnitude 3 would not present a risk to personal safety or damage to property on the surface.”*
- *“There have been more than a million similar treatment operations in the world over the last 50 years or so and there are only two cases where similar seismic reactions occurred.”*

Scientific Studies - Seismicity

Studies Concerning Induced Seismicity

Continued

Oklahoma Geological Survey Report, 2011

- *“The earthquakes range in magnitude from 1.0 to 2.8”*
- *The US Geological survey on magnitude 3 seismicity: many people do not recognize it as an earthquake, vibrations are “similar to the passing of a truck”*
- *Whether or not the earthquakes in the Eola Field were triggered by hydraulic-fracturing these were small earthquakes with only one local resident having reported feeling them.”*

Scientific Studies - Climate

Studies Concerning Climate Impact

Cornell University, 2011 - Howarth study finds natural gas emissions impacts are worse than coal. Claims have since been refuted by:

- University of Maryland
- Carnegie Mellon University - Sierra Club Funded
- Massachusetts Institute of Technology
- National Energy Technology Laboratory
- IHS-CERA
- US Department of Energy
- Wood Mackenzie
- Global Warming Policy Foundation
- Worldwatch Institute
- Environmental Defense Fund
- Cornell University



Despite overwhelming evidence to the contrary, public concern continues...

How can industry respond?



Transparency

Increasing knowledge and awareness

Transparency in Water

FracFocus.org

- Developed by Groundwater Protection Council
- Initially voluntary effort
- Now adopted by rule in Eight states
- As of 2013, more than 200 operators have disclosed fracture fluid compositions for over 15,000 wells



Transparency in Water

Service Company Transparency

- In addition to Frac Focus, service companies post on their websites the Material Safety Data Sheets for their chemicals on their websites
- Green Chemicals



Transparency in Water

Baseline Water Quality Sampling

- Adopted by many companies for drilling in new areas, gives a snapshot of water quality pre-drilling
- Devon has sampled 205 wells in multiple regions, including Permian Basin, Mississippian Lime, Utica Shale, Tuscaloosa Marine Shale, DJ Basin and other emerging unconventional plays.

Transparency in Water

Devon adopted the voluntary Program for the following five principal reasons:

- Counter misinformation concerning the impact of oil & gas HF operations upon groundwater quality;
- Provide additional transparency concerning oil and gas HF operations;
- Mitigate exposure to groundwater pollution claims;
- Build public support for field operations; and,
- Be proactive implementing industry Best Management Practices.

Transparency in Water

Industry Benchmarking

- AXPC Water Use Intensity Survey
- Texas Bureau of Economic Geology water use survey for oil & gas water use

Transparency in Air and Climate

- Corporate Social Responsibility Reporting
 - Lists emission reduction activities
 - Also lists water recycling efforts
- Industry Benchmarking
 - Carbon Disclosure Project for GHG and Water Disclosure Information Request
 - Investors representing over \$40 trillion in assets
 - Examines companies in CDP's portfolios to assess potential risks
 - Also examines opportunities relating to changing patterns of water availability

Transparency in Safety

Public outreach

- First responders
- Fire departments
- Police
- Public Health Officials
- Community Townhalls

To no avail

Despite the scientific evidence, and industry transparency, federal regulations are still being presented to address the public concern



Public Policy and Regulatory Development

Public Policy and Regulations

Cause and Effect?

New Federal Regulations Emerge

- BLM HF Rule
- Subpart W MRR - with disproportionate burden on oil and gas
- NSPS Quad O - specific requirements to control emissions that have yet to be demonstrated to exist
- TSCA
- RCRA - challenge to the subtitle C waste exemption

Public Policy and Regulations

Cause and Effect?

- New Federal Regulations Proposed
 - EPA Diesel Guidance
 - EPA Induced Seismicity Guidance
- Industry typically supports improvements to state regulation

Public Policy and Regulations

Cause and Effect?

Important Questions:

What is fueling this push for more regulation?

What can industry do to better educate?

What can industry do to restore trust?

Thank You

Question & Answer Discussion

Q&A

We have allotted 30 minutes for questions and answers.

Thank you for submitting your questions.

Thank You for Joining Us!



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