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Testimony to 2011 Joint Committee on Energy and Environmental Policy

Hydraulic Fracturing
Regulatory & Policy Considerations

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Good afternoon, Chairman Holmes, Vice-Chair McGinn and members of the committee. I am Edward Cross, President of the Kansas Independent Oil & Gas Association (KIOGA). KIOGA represents the interests of independent oil and natural gas producers in Kansas. With over 1,400 members across the entire state, KIOGA is the lead state and national advocate for Kansas independent oil and natural gas producers. Our members account for 86% of the oil and 63% of the natural gas produced in Kansas. I am responsible for public policy advocacy and interaction with external stakeholders including elected officials, regulators, governmental decision-makers, and community thought leaders. I am here this afternoon to summarize issues and challenges surrounding hydraulic fracturing (HF).

For more than 60 years, America's energy producers have relied on an innovative technique known as hydraulic fracturing (HF) to enhance the production of oil and natural gas. While the first commercial "frac job" - as it is referred to within the industry - was conducted in 1947, the technique quickly became the most commonly used method of stimulating oil and natural gas wells.

What is Hydraulic Fracturing

HF is a proven technology to increase the recovery of crude oil and natural gas from underground formations. Developed in the late 1940s, HF is a process consisting of pumping a mixture of water and sand at high pressure into isolated zones to enhance the natural fractures that exist in the formation. During the process, long, narrow cracks are created to serve as a flow channel for oil and natural gas trapped in the formation. Proppants (usually sand) in the fluid keep the fractures open to create a pathway for oil and natural gas to migrate to the well bore. HF treatments are designed to specific conditions of the target formation (thickness, rock fracture characteristics, reservoir geochemistry, etc.) to optimize the development of a network of fractures. Their design is based on an understanding of the in-situ conditions present in the reservoir.

Why is HF necessary?

HF is essential for recovering crude oil and natural gas resources from formations that would be unavailable through other completion practices. Without HF, existing wells would deplete very quickly or would have never been commercially productive. HF is applied to the majority of America's oil and natural gas wells to enhance well performance, minimize drilling, and recover otherwise inaccessible resources. In fact, a vast majority of the wells in operation today have been fractured, and the process continues to be applied in new and innovative ways to boost production of American energy in unconventional formations, such as "tight" gas sands, shale deposits and coalbeds. As a result, HF is now responsible for 30% of our domestic oil and natural gas, and has aided in the extraction of more than 600 trillion cubic feet of natural gas and 7 billion barrels of oil. According to the National Petroleum Council, 60% to 80% of all wells drilled in the U.S. in the next decade will require fracturing to remain viable.

What's in fracturing fluid?

According to the U.S. Department of Energy (DOE) and Ground Water Protection Council (GWPC), HF fluids consist of 99.5% water and sand. In addition, there are small amounts of other compounds, each of which play a critical role in the process. The vast majority of these materials can be found in the food we eat, beverages we drink, and household cleaning items we keep under the sink. State regulators are made aware of those chemicals, and have access to all information they need regarding their safe use.

Does HF pose a risk to public health?

The United States Environmental Protection Agency (EPA) released a report in 2004 concluding that the technology poses "no threat" to underground drinking water. Clinton Administration EPA chief Carol Browner testified in 1999, finding "no evidence that . . . hydraulic fracturing . . . has resulted in any contamination or endangerment of underground sources of drinking water." On May 25, 2011 EPA Administrator Lisa Jackson stated, under oath, "I'm not aware of any proven case where the fracking process itself has affected water, although there are investigations ongoing." Other studies conducted over the years have reinforced these conclusions. Among them are the GWPC *Inventory and Extent of Hydraulic Fracturing in Coalbed Methane Wells in the Producing States* (1998); Interstate Oil & Gas Compact Commission *States' Experience with Hydraulic Fracturing* (2002).

Is HF regulated?

HF has been effectively regulated by state governments and oversight agencies since its inception. At both the federal and state level, all of the laws, regulations, and permits that apply to oil and natural gas exploration and production activities also apply to HF. These include all laws and regulations related to well design, location, spacing, operation, and abandonment as well as environmental activities and discharges, including water management and disposal, waste management and disposal, air emissions, underground injection, surface disturbance, and worker health and safety. The process of HF is subject to a rigorous and well established process, developed in accordance to the geology, hydrology, climate, topography, industry characteristics, development history, state legal structures, population density, and local economics unique to each state. The GWPC, considered one of the nation's leading groundwater protection organizations, released a report in 2009 underscoring this record of safety and performance on the state level finding the "current state regulation of oil and

gas activities is environmentally proactive and preventive." GWPC additionally found that the "regulation of oil and gas field activities is managed best at the state level where regional and local conditions are understood and where regulations can be tailored to fit the needs of the local government."

Well operators not only work with state regulators, but also comply with numerous federal requirements. The Occupational Safety and Health Administration, the Environmental Response Compensation and Liability Act and the Toxic Substances Control Act all contain record keeping and reporting rules followed by energy producers. These regulations ensure all chemicals used in the extraction process are properly handled and stored, and that workers and first responders are made aware of the substances they handle.

How is the risk of ground water contamination further reduced?

In Kansas, underground aquifers containing potable water typically reside from 50 to 1,000 feet below the surface while HF operations typically occur between 2,000 and 6,000 feet below the surface. In addition to state requirements, the GWPC notes in its report that the potential risk of endangerment to ground water is further reduced by physical factors such as the vertical distance between the fractured zone and ground water; presence of other zones between the fractured zone and the deepest ground water zone that may readily accept fluid; and the presence of vertically impermeable formations between the fractured zone and the deepest ground water zone, which act as geological barriers to fluid migration.

The GWPC and the Interstate Oil & Gas Compact Commission (IOGCC) developed a web-based database (www.FracFocus.org) that allows companies to voluntarily disclose chemical constituents in frac fluids. I believe FracFocus can be a significant factor in refuting the arguments that a federal reporting program is needed and KIOGA encourages Kansas operators to register and submit information on HF operations to the FracFocus website. Indeed, state oil and gas associations nationwide are encouraging operators to submit information on HF operations to the FracFocus website. As of August 29th, the website reported 3,719 HF operations nationwide were reported and the number is growing rapidly. In general, industry is not opposed to transparency in the disclosure of frac fluid components, but strongly opposed to EPA involvement.

The IOGCC also announced last June their new project to develop a public website that allows viewers to collect state-specific oil and gas regulations associated with HF. The website will allow the user the ability to cross-reference state statutes that regulate HF and generate a PDF report.

Economic Impact of Hydraulic Fracturing

HF is helping our nation become more energy independent. Oil imports are now below 50% and we measure natural gas reserves in centuries. Without HF, studies indicate 50% of America's oil wells and 33% of America's natural gas wells would be closed. Domestic oil production would be slashed by 183,000 barrels per day and domestic natural gas production would be slashed by 245 billion cubic feet per day. By 2014, our nation's real GDP would be lowered by $374 billion and employment would fall by 2.9 million jobs, including 5,000-7,000 Kansas jobs.

Conclusion

Environmental activists continue to generate unreasonable anxiety around the country over chemicals used in the HF process. Despite a clear and compelling history of effective state regulation, the environmental group's unyielding accusations create demands for more information on chemicals. Some environmental groups have been campaigning for years to move HF oversight from states to federal jurisdiction, where it could be subject to a host of new regulatory burdens that could discourage exploration, slow production, reduce oil and natural gas supplies, raise energy costs, and erode high-paying jobs. These environmental groups propose to subject all HF of oil and natural gas wells to the requirements of the federal underground injection control (UIC) program under SDWA, despite language excluding this in the Energy Policy Act of 2005. Despite its longstanding record of safety and widespread utilization in the United States, many of the hard facts about HF are not widely known, or have been misrepresented in the public light. For decades, HF oversight has remained with states, which continue to compile a remarkable record of oversight and enforcement. The EPA confirmed as much to the U.S. Senate in 2010 when they said there existed no evidence that states aren't doing a good job already when it comes to regulating HF activities. Also, on February 15, 2010, Steve Heare Director of EPA's Drinking Water Protection Division said that state regulators were doing a good job overseeing HF and there was no evidence the process causes water contamination.

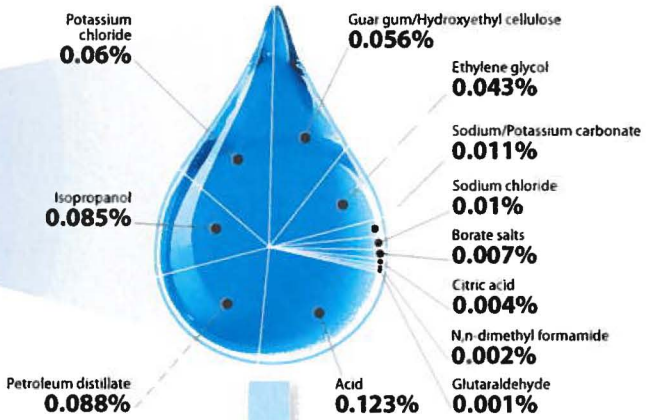
An extensive regulatory apparatus at all levels of government, including federal level, is in place to ensure HF continues to be well regulated. Because they understand the regional and local conditions and have every motivation to protect the environment in which they and their families live, state regulators are in the best position to protect groundwater and drinking water sources. Industry also has strong incentives to maintain a high level of environmental performance, and it has worked hard to review and improve its operations and communication with the public. With the development of FracFocus, E-Reference, and a number of efforts on frac fluid disclosure underway across the nation, environmental groups are seeing their ability to scare the public erode. Environmental groups attempts to criticize the state regulatory process is illustrative of the shallow and wholly flawed approach they use to link unrelated incidents in an innuendo filled collection of unfounded allegations.

I appreciate the opportunity to provide these comments. KIOGA believes HF is of critical importance to our national energy security and economic recovery. HF is a proven technology that industry has demonstrated time and gain can be used safely. Thank you for your time and consideration. I stand for questions.

A FLUID SITUATION:

TYPICAL SOLUTION* USED IN HYDRAULIC FRACTURING

0.49%
ADDITIVES*



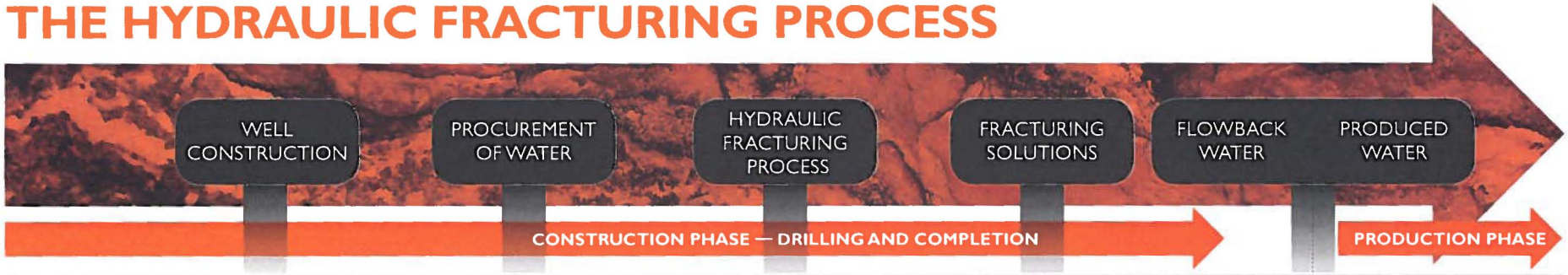
Compound*	Purpose	Common application
Acids	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
Glutaraldehyde	Eliminates bacteria in the water	Disinfectant; Sterilizer for medical and dental equipment
Sodium Chloride	Allows a delayed break down of the gel polymer chains	Table Salt
N, n-Dimethyl formamide	Prevents the corrosion of the pipe	Used in pharmaceuticals, acrylic fibers and plastics
Borate salts	Maintains fluid viscosity as temperature increases	Used in laundry detergents, hand soaps and cosmetics
Polyacrylamide	Minimizes friction between fluid and pipe	Water treatment, soil conditioner
Petroleum distillates	"Slicks" the water to minimize friction	Make-up remover, laxatives, and candy
Guar gum	Thickens the water to suspend the sand	Thickener used in cosmetics, baked goods, ice cream, toothpaste, sauces, and salad dressing
Citric Acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
Potassium chloride	Creates a brine carrier fluid	Low sodium table salt substitute
Ammonium bisulfite	Removes oxygen from the water to protect the pipe from corrosion	Cosmetics, food and beverage processing, water treatment
Sodium or potassium carbonate	Maintains the effectiveness of other components, such as crosslinkers	Washing soda, detergents, soap, water softener, glass and ceramics
Proppant	Allows the fissures to remain open so the gas can escape	Drinking water filtration, play sand
Ethylene glycol	Prevents scale deposits in the pipe	Automotive antifreeze, household cleansers, deicing, and caulk
Isopropanol	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, and hair color

On average, **99.5%** of fracturing fluids are comprised of freshwater and compounds are injected into deep shale gas formations and are typically confined by many thousands of feet or rock layers.

Source: DOE, GWPC: Modern Gas Shale Development In the United States: A Primer (2009)

*The specific compounds used in a given fracturing operation will vary depending on source water quality and site, and specific characteristics of the target formation. The compounds listed above are representative of the major material components used in the hydraulic fracturing of natural gas shales. Compositions are approximate.

FEDERAL STATUTES REGULATE EVERY STEP OF THE HYDRAULIC FRACTURING PROCESS



CWA
- Water Resource Protection
- Inspection and Enforcement Authority

OSHA
- Worker Safety and Operations
- Inspection and Enforcement Authority

CWA
- Water Resource Protection
- Inspection and Enforcement Authority

OSHA
- Worker Safety and Operations
- Inspection and Enforcement Authority

OSHA
- Worker Safety and Operations
- Chemical Disclosure
- Inspection and Enforcement Authority

SUPERFUND
- Spill Reporting
- Clean Up
- Inspection and Enforcement Authority

EPRCA
- Hazardous Substance Reporting
- Inspection and Enforcement Authority

CWA
- Spill Prevention Control and Countermeasures
- Management Requirements
- Inspection and Enforcement Authority

CWA
- Water Resource Protection and Discharge Requirements
- Reporting
- Inspection and Enforcement Authority

SDWA
- Water Injection Requirements
- Inspection and Enforcement Authority

CWA: Clean Water Act • OSHA: Occupational Safety and Health Administration • SDWA: Safe Drinking Water Act • EPRCA: Community "Right to Know" Act

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A LOOK BACK: HF, SDWA, AND RECENT EFFORTS BY STATES TO FIGHT BACK

1948 — Hydraulic fracturing first commercially employed.

1974 — SDWA amended, creates the authority for states to be granted primacy for regulating Class II injection wells, assuming they can show equivalent environmental protections in place; also clarifies that natural gas storage is not underground injection.

1980 — SDWA amended to regulate over 100 specific drinking water contaminants; hydraulic fracturing, in practice at this point for nearly 40 years, never considered for SDWA regulation.

1986 — Safe Drinking Water Act (SDWA) enacted.

Aims to protect public water supplies and establishes new standards and regulations to protect underground sources of drinking water (USDW).

Despite having been commercially utilized for nearly 25 years up to this point, hydraulic fracturing never considered for regulation under SDWA.

1996 — Legal Environmental Assistance Foundation (LEAF) v EPA - arguing that fracturing of coalbed methane in Alabama should be regulated under SDWA, without considering any legislative history or environmental impacts.

1997 — 1996 SDWA amended to emphasize sound science and risk-based standard setting; no suggestion that hydraulic fracturing be regulated under SDWA.

2000 — EPA releases draft of hydraulic fracturing study, concludes the technology does not pose a risk to drinking water.

2002 — LEAF challenges EPA's decision to allow Alabama to regulate hydraulic fracturing under its Class II well program. EPA initiates its own study of hydraulic fracturing.

2003 — Major service companies sign memorandum of agreement with EPA, declare the use of diesel fuel off-limits in the fracturing of coalbed methane wells near USDWs.

2004 — EPA releases its final report on the use of hydraulic fracturing in coalbed methane operations; reasserts that hydraulic fracturing poses "no threat" to drinking water.

2005 — 2005 House passes bipartisan energy bill that, among other things, clarifies that Congress never intended hydraulic fracturing to be regulated under SDWA.

2007 — Explosion occurs at home in Bainbridge, Ohio, incident blamed on hydraulic fracturing, which is rejected and corrected in subsequent investigations.

2008 — Outside interest groups expand efforts to attack hydraulic fracturing in mid-Atlantic United States (Marcellus Shale).

- HR 7271 (DeGette, Hinchey, Salazar) introduced in the House seeking to strip clarifying language in 2005 energy bill. Interest groups push for restrictions on hydraulic fracturing to be added to state regulations in New Mexico and county ordinances in Colorado and New Mexico.

2009 — States remind Congress that regulation and risk management at the state level is, and always has been, the most effective approach.

Alabama asks Congress to preserve state primacy to regulate hydraulic fracturing.

Louisiana urges Congress to "take such actions as necessary" to preserve hydraulic fracturing.

Oklahoma passes concurrent resolution urging Congress not to pass legislation that imposes federal regulation over hydraulic fracturing.

Pennsylvania introduces resolution supporting continued state regulation of hydraulic fracturing.

Texas urges Congress to "maintain state regulatory coverage" of hydraulic fracturing.

Rep. DeGette again introduces legislation targeting hydraulic fracturing; Sens. Casey (PA) and Schumer (NY) introduce companion bill in the Senate.

GWPC analysis finds state regulations associated with hydraulic fracturing protect drinking water.

GASLAND DEBUNKED

WRONG ON THE LAW

***GasLand* myth:**
"What I didn't know was that the 2005 energy bill pushed through Congress by Dick Cheney exempts the oil and natural gas industries from the Clean Water Act, the Clean Air Act, the Safe Drinking Water Act...and about a dozen other environmental regulations." (6:05)

Actual truth:

- ✓ The oil and natural gas industry is regulated **under every single one of these federal laws** — under provisions of each that are relevant to its operations.
- ✓ The 2005 energy bill was supported by nearly three-quarters of the U.S. Senate, including then-Sen. Barack Obama of Illinois. In the U.S. House, 75 Democrats joined 200 Republicans in supporting the final bill.

WRONG ON THE PROCESS

***GasLand* myth:**
"The fracking itself is like a mini-earthquake. ... In order to frack, you need some fracking fluid – a mix of over 596 chemicals." (6:50)

Actual truth:

- ✓ The fracturing process uses a mixture of fluids comprised almost entirely (99.5%) of water and sand. The remaining materials, used to help deliver the water down the wellbore, are typically found and used around the house. The average fracturing operation utilizes fewer than 12 of these components, according to the Ground Water Protection Council — not 596.
- ✓ Over the course of its history, fracturing has not only been used to increase the flow of oil and natural gas from existing wells, but also to access things like water and geothermal energy. It's even been used by EPA to clean up Superfund sites.

WRONG ON DISCLOSURE

***GasLand* myth:**
"Fracking chemicals are considered proprietary." (1:00:56)

Actual truth:

- ✓ The **entire universe of additives used in the fracturing process** is known to the public and the state agencies that represent them.
- ✓ Not only do individual states mandate disclosure, the federal government does as well. The Occupational Safety and Health Administration (OSHA) mandates this information be kept at every wellsite, and made readily available to response and medical personnel in case of an emergency.

WRONG ON FLAMMABLE FAUCETS

***GasLand* myth:**
Methane in the water in Fort Lupton, Colo. said to be the result of natural gas development.

Actual truth:

- ✓ Colorado debunks the claim: "Dissolved methane in well water **appears to be biogenic [naturally occurring] in origin**. ...There are no indications of oil & gas related impacts to water well." (COGCC, 9/30/08)

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