

Hydraulic Fracturing

ECOS-IOGCC Forum

Branson, Missouri

21 September 2008

Bill Sydow

Nebraska Oil and Gas Conservation Commission

ENVIRONMENT

The Dirty Side Of Domestic Fuel

Most Americans want the country to be free of its dependence on foreign fuel. But what many might not know is that using homegrown oil and natural gas may come at a high cost.

There are close to 1 million oil and gas wells across 33 states in the U.S. New ones are being drilled at a rapid rate—more than 40,000 last year alone. Extracting oil and gas is known to release toxic chemicals, including mercury, benzene and arsenic, and harmful chemicals are routinely injected underground to boost output. However, such wells are exempt from the parts of the federal Safe Drinking Water Act and Clean Air Act that would control these substances. “Loopholes were written because of the industry’s influence in Washington,” says Amy Mall of the Natural Resources Defense Council (NRDC), who co-authored a new report on the subject. “These decisions ignored the best available science.”

American oil may not be worth the price



GOVERNMENT WATCH

Why Deport a Hero?

■ In the ongoing war against extremists in Iraq and Afghanistan, our

Refineries are not exempt and are regulated. Oil and gas exploration is regulated by states.

Well operators also are not required to file an annual toxic-release inventory, a list of chemicals emitted.

“People living near wells have reported alarming health problems. Steve and Elizabeth Mobaldi, whose home was within a mile of about 20 wells in Colorado, suffered ailments ranging from painful blistering and nosebleeds to headaches and tumors. “It amazes me that the companies are allowed to not follow the same laws as other industries,” says Steve.

NRDC is calling for the government to tighten its regulation of gas drilling and for the industry to adopt pollution-reducing practices.

Is extracting domestic oil and natural gas important enough that companies should be granted exemptions from pollution laws? Tell us at Parade.com.

MONEY

College Kids: Beware Of Easy Credit

At least 15 states have clamped down on the activities of credit-card companies on college campuses. Many schools accept big payments from banks. In return, they may give banks personal student information to use for marketing purposes or allow them on campus to sign up customers—most of whom have no steady income.

Warns Robert Lawless, a University of Illinois law professor: “Unless companies



WHAT YOU SAID

In a recent issue, we asked:

Should There Be an Age Limit For Senators?

91% YES

“Most of corporate America requires retirement by age 70. The Senate should too. Some Senators are there for decades, and it’s impossible for anyone who’s in office for that long to relate to the real world.”

—Jim Thomas, Bonita Springs, Fla.

“We should have age and term restrictions. Senators should be held to two terms, just like the President. This would also help eliminate pork, since Senators would not be able to develop the power to request it.”

—R.V., Carson City, Nev.

9% NO

“I oppose age or term limits. If the voters choose to elect an older politician, we should follow their will. Only they can decide if a person is unfit for office.”

—William Doyle, Clark, N.J.

“I believe that society works best when the energy and idealism of youth pairs with



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Robert Nickelsberg / Getty Images

Pumped: Workers release carbon-dioxide vapor after 'fracking' a natural-gas well in eastern New Mexico

PROJECT GREEN

A Toxic Spew?

Officials worry about impact of 'fracking' of oil and gas.

By [Jim Moscou](#) | Newsweek Web Exclusive
Aug 20, 2008 | Updated: 5:26 p.m. ET Aug 20, 2008

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- 9 Lehman: Why Some Banks Don't Get Aid
- 10 The Economy: Why It's Worse Than You Think

Set Range: Past 24 hrs

Updated 9/17/2008 12:16AM EST

GALLERY



The Most Fuel Efficient Cars

Ten small and stylish rides that save gas and money

- The Car of the Future
- Why Cars Don't Get 50mpg
- Energy: Is Offshore Oil Drilling the Answer?
- Gallery: The History of Solar Energy
- Cars vs. Bikes: The New Road Rage

From the Editors (2)

- [The Most Fuel Efficient Cars](#)

Recommended (6)

- [Going Green Means Staying Profitable for](#)

Topics (4)

- [Clinton Marshall](#)



Hydraulic Fracturing

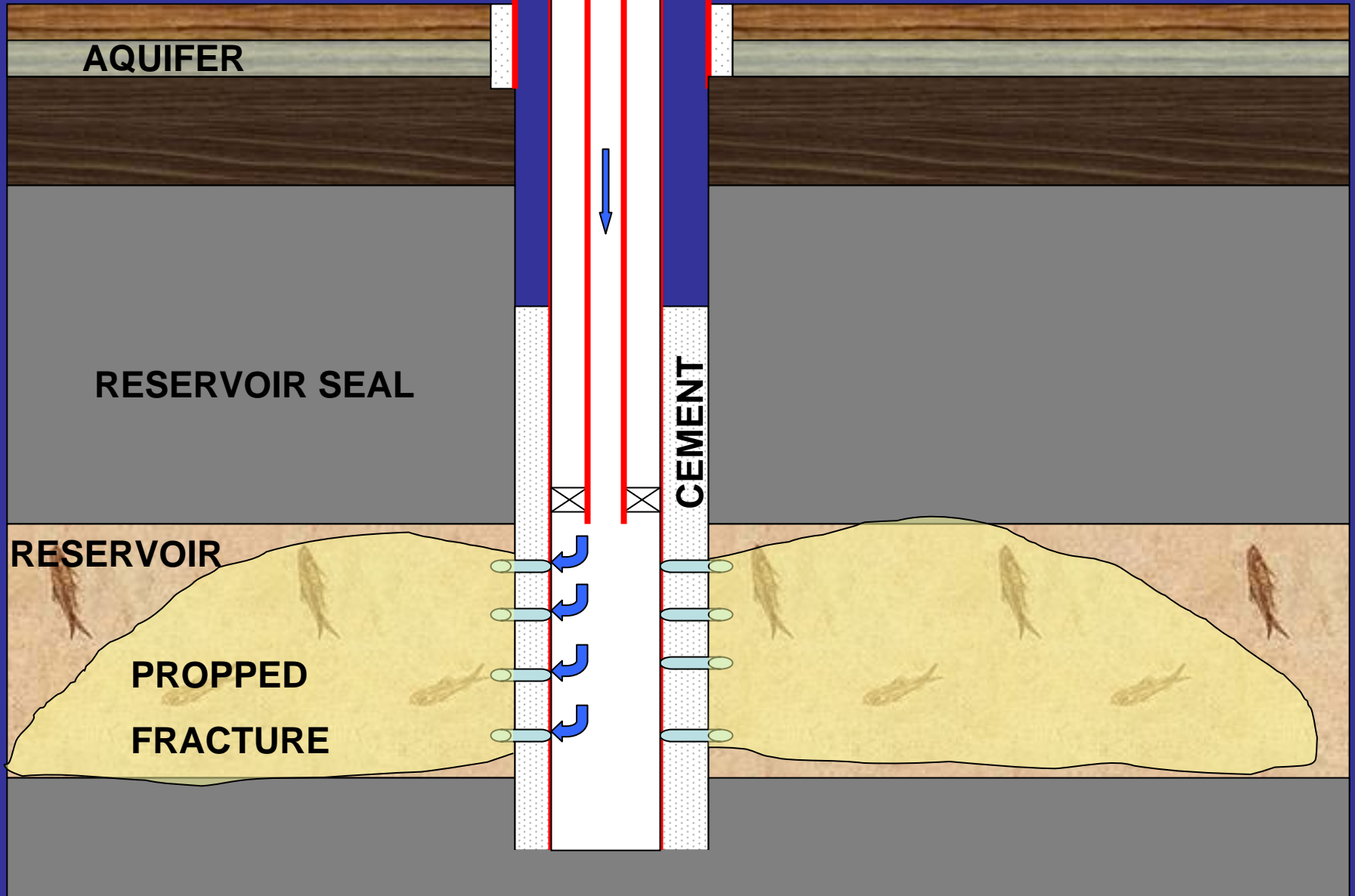
- **Creation of artificial fracture systems in reservoirs containing oil, gas, water, steam**
- **Artificial fractures are mechanically propped open with sand, sintered bauxite, glass beads**
- **Fluid is generally a water or foam-based fluid and is viscosified with gelling agents, primarily guar**
- **Additives for control of clays, fluid loss to zone, friction reduction, gel breakers can be added**

Surface Operations

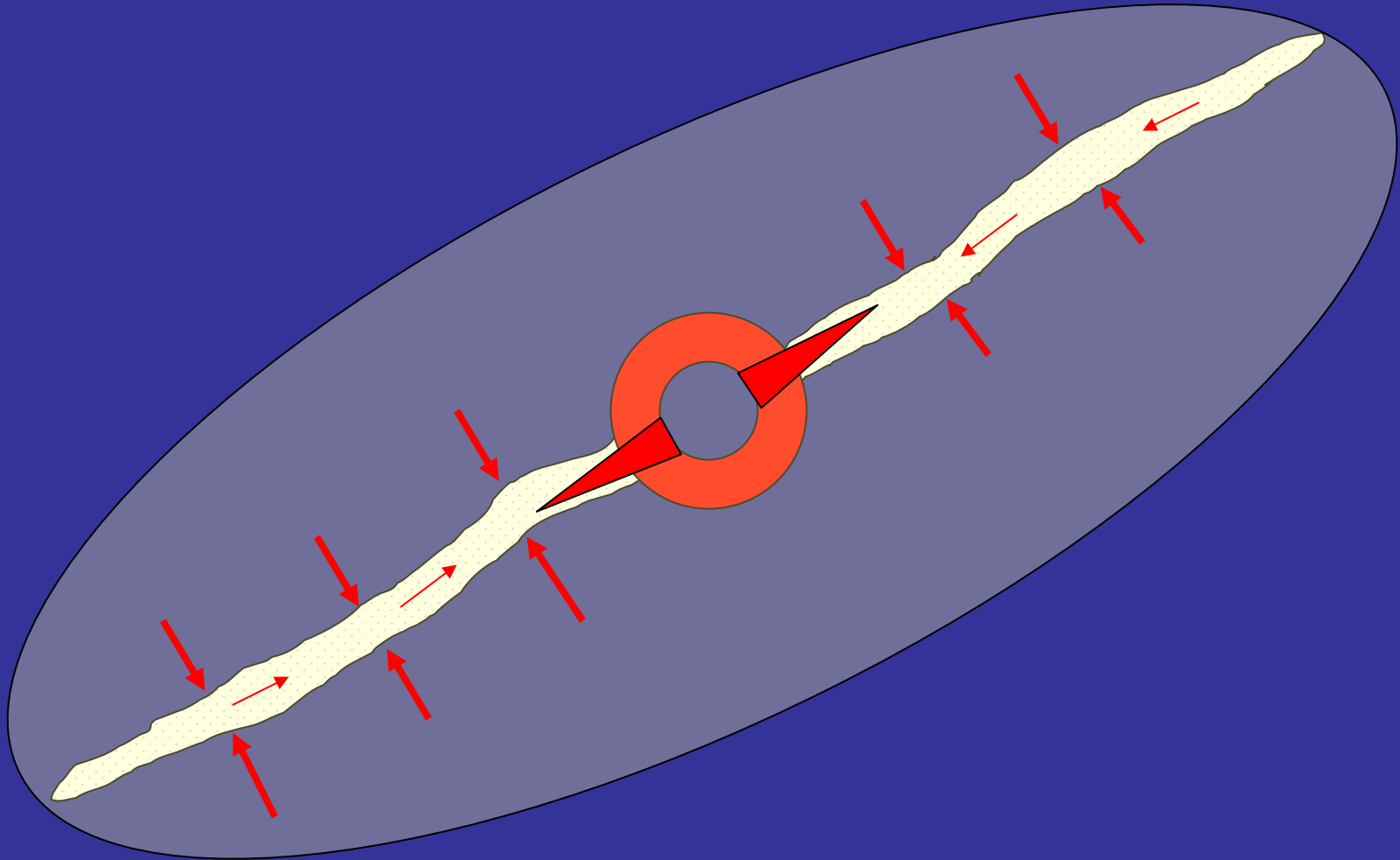


Source: www.halliburton.com

Idealized Cross Section



Plan View of the Fracture



Not a “New” Technique

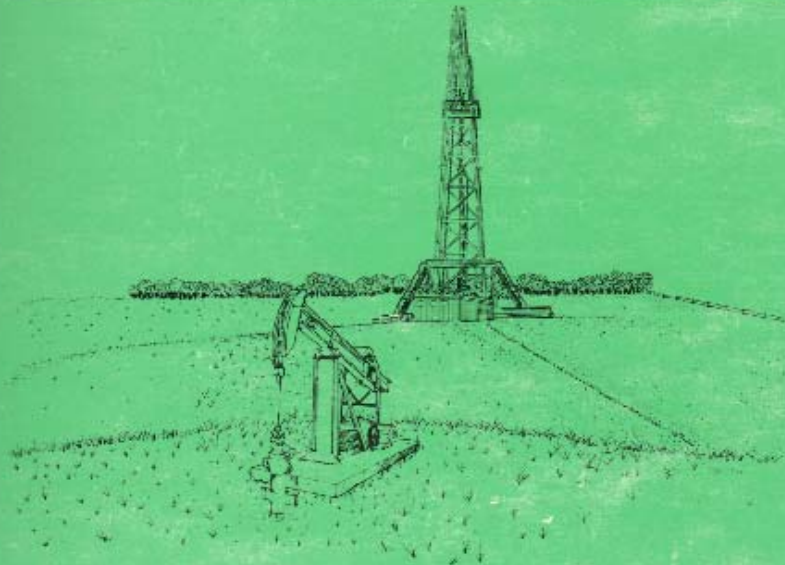
- First fracture stimulation pumped in 1947 by Stanolind Oil Company in Grant County, Kansas
- Stanolind patented the Hydra-Frac
- First commercial stimulation pumped in 1949 in Oklahoma by Stanolind and Halliburton
- Tens of thousands of stimulations have been pumped in the past 61 years

Regulation of Oil Field Waste

- Nature of wastes was studied by USEPA during 1986 and 1987
- In 1988, based on benign nature of oil field wastes and in-place state regulatory programs, USEPA recommended an exemption from *federal* regulation under RCRA
- Waste streams are regulated by the *states*

API ENVIRONMENTAL GUIDANCE DOCUMENT

ONSHORE SOLID WASTE MANAGEMENT IN EXPLORATION AND PRODUCTION OPERATIONS



FIRST EDITION, JANUARY 15, 1989

American Petroleum Institute
1220 L Street, Northwest
Washington, DC 20005



API

January 1989

**INTERSTATE OIL
COMPACT COMMISSION**

**EPA/IOCC STUDY OF
STATE REGULATION
OF OIL AND GAS
EXPLORATION AND
PRODUCTION WASTE**

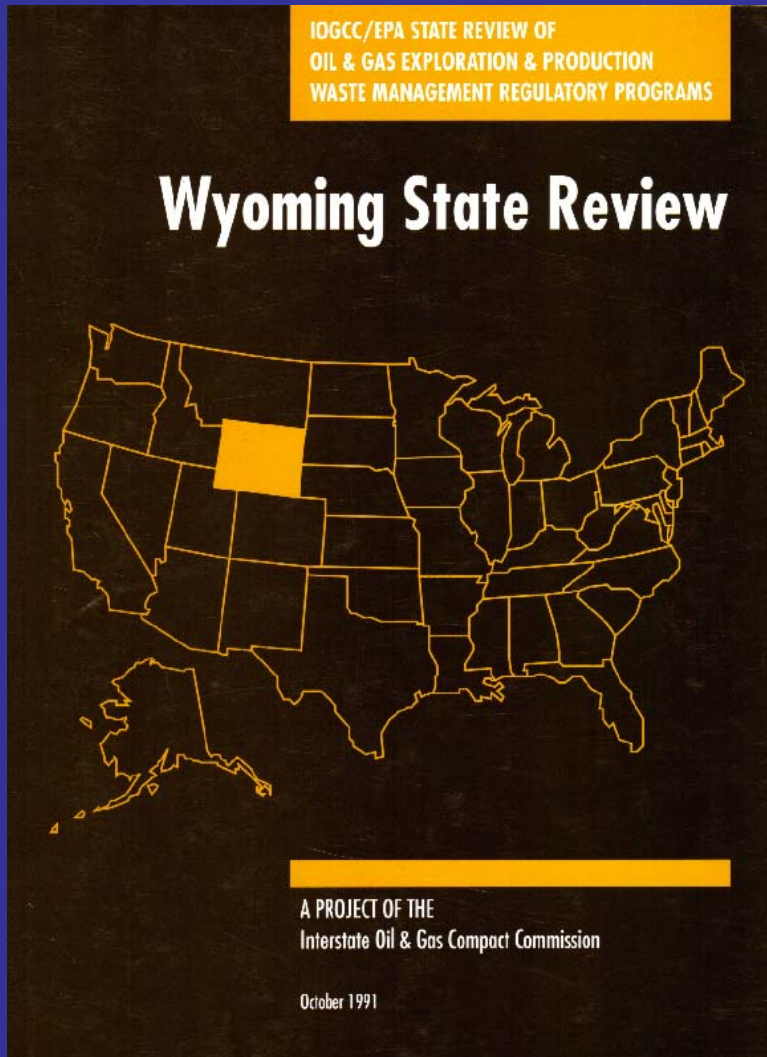
A PROJECT OF THE INTERSTATE OIL COMPACT
COMMISSION'S COUNCIL ON REGULATORY NEEDS

DECEMBER 1990

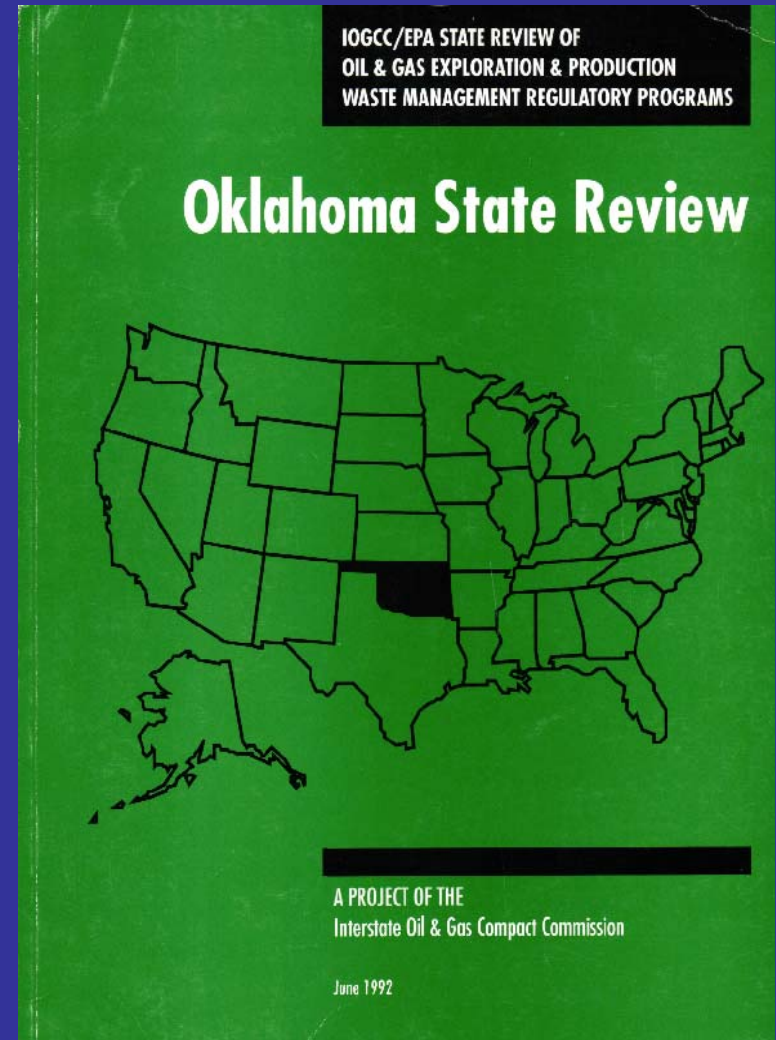


**Joint Study
USEPA / IOCC
December 1990**

State Review Process 1991

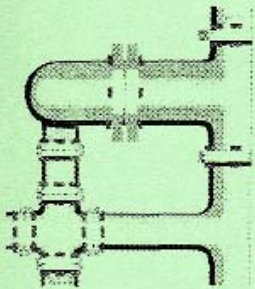


October 1991



June 1992

**EXPLORATION AND
PRODUCTION
(E&P)
WASTE MANAGEMENT
TRAINING**



INTERSTATE OIL AND GAS

Compact Commission

900 NE 23rd, Street
Oklahoma City, Oklahoma 73119-3127
(405) 526-3556

**ROBERTS/SCHORNICK
& ASSOCIATES, INC.**

Environmental Consultants

3700 West Robinson, Suite 200
Norman, Oklahoma 73072
(405) 321-3895

Training Manual

IOGCC

October 1991

**New York and
Pennsylvania
were the first
trained**

**OIL AND GAS
EXPLORATION
AND
PRODUCTION WASTE
MANAGEMENT:**

A 17-STATE STUDY



Prepared for:
U.S. Department of Energy
Office of Fossil Energy
and
Interstate Oil and Gas Compact Commission

June 1993

**IOGCC
June 1993
Funded by DOE**

Alabama	Ohio
California	Oklahoma
Colorado	Pennsylvania
Kansas	Texas
Louisiana	Utah
Michigan	West Virginia
Mississippi	Wyoming
Montana	
New Mexico	
North Dakota	

**Represented over 97%
Of Lower 48 Daily Oil
and Gas Production**

INTERSTATE OIL & GAS
COMPACT COMMISSION

**IOGCC
ENVIRONMENTAL
GUIDELINES FOR STATE
OIL & GAS REGULATORY
PROGRAMS**

A PROJECT OF THE INTERSTATE OIL & GAS COMPACT
COMMISSION'S COUNCIL ON REGULATORY NEEDS

MAY 1994



**IOGCC
May 1994**



Guidelines for

WASTE MINIMIZATION

In Oil and Gas
Exploration and Production

A Publication of the
Interstate
Oil and Gas
Compact
Commission
Waste Minimization
Subcommittee

**IOGCC
March 1998**

Funded by DOE

**This manual was
originally prepared by
the Railroad
Commission of Texas
as an aid to oil and
gas operators.**

United States
Environmental Protection
Agency

EPA530-K-95-003
May 1995

Solid Waste and Emergency Response (5305)



Crude Oil and Natural Gas Exploration and Production Wastes: Exemption from RCRA Subtitle C Regulation



Recycled/Recyclable

Printed with soy/canola ink on paper that
contains at least 20% postconsumer fiber.

USEPA

EPA530-K-95-003

May 1995

USEPA

June 2004

Hydraulic Fracturing of Coalbed Methane Wells | UIC | US EPA - Internet Explorer provided by Dell

http://www.epa.gov/ogwdw/uic/wells_coalbedmethanestudy.html

U.S. ENVIRONMENTAL PROTECTION AGENCY

Underground Injection Control Program

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You are here: EPA Home » Water » Safewater » Underground Injection Control Program » Study to Evaluate the Impacts to USDWs by Hydraulic Fracturing of Coalbed Methane Reservoirs

Study to Evaluate the Impacts to USDWs by Hydraulic Fracturing of Coalbed Methane Reservoirs

The study of coalbed methane (CBM) wells involved interviews with approximately 50 state and local government agency staff members, communications with about 40 citizens who were concerned that CBM production had adversely affected their drinking water wells, and searches for confirmed incidents of drinking water well contamination. EPA published a draft report in August 2002, requested public comment, and incorporated changes as appropriate in the final report.

Below are links to the major documents prepared as part of EPA's effort to gather and analyze information related to the potential impacts on underground sources of drinking water from the injection of hydraulic fracturing fluids into CBM wells.

- Visit the [hydraulic fracturing](#) page for more information about hydraulic fracturing and for background on why EPA conducted the study.

Final Study

- [Study Fact sheet \(EPA 816-F-04-017\) June 2004 \(PDF\)](#) (2 pp, 91K)
- [Download Entire Study \(ZIP File\)](#) (13MB zip file)
- [Executive Summary \(PDF\)](#) (22 pp, 2MB)
- [Cover, Table of Contents, Glossary \(PDF\)](#) (20 pp, 384K)
 - [Chapter 1 - Introduction \(PDF\)](#) (11 pp, 878K)
 - [Chapter 2 - Study Methodology \(PDF\)](#) (7 pp, 54K)
 - [Chapter 3 - Characteristics \(PDF\)](#) (32 pp, 1092K)
 - [Chapter 4 - Hydraulic Fracturing Fluids \(PDF\)](#) (26 pp, 1.21MB)
 - [Chapter 5 - Summary of Coalbed Methane Basin Descriptions \(PDF\)](#) (17 pp, 704K)
 - [Chapter 6 - Water Quality Incidents \(PDF\)](#) (16 pp, 94K)
 - [Chapter 7 - Conclusions and Recommendations \(PDF\)](#) (6 pp, 34K)

Appendices

- [Appendix A - Department of Energy - Hydraulic Fracturing White Paper \(PDF\)](#) (23 pp, 495K)
- [Appendix B - Quality Assurance Plan \(PDF\)](#) (14 pp, 139K)
- [Master References \(PDF\)](#) (15 pp, 79K)

Attachments

You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.

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Microsoft PowerPoint... Hydraulic Fracturing ... 8:21 AM

Hydraulic Fracturing

- **60 years old**
- **Fluids and additives have been studied**
- **Regulated as an E&P waste by states**
- **Most recent studies by US EPA found no contamination of ground water**
- **Safe, regulated, and needed**