



To read the full NRDC report on oil and gas drilling, including the stories of people affected by drilling in their communities, visit [www.nrdc.org/policy](http://www.nrdc.org/policy).

## Drilling Down: Protecting Western Communities from the Health and Environmental Effects of Oil and Gas Production

For more information, please contact  
**Amy Mall**  
(720) 565-0188

The oil and gas industry in the United States has expanded rapidly during the last decade, particularly in the Rocky Mountain region. But oil and gas production releases pollution that can have serious impacts on people's health and the surrounding air, water, and land. Although these operations are frequently located near homes, schools, and other community resources, the oil and gas industry enjoys numerous exemptions from provisions of federal laws intended to protect human health and the environment. NRDC's latest report provides a comprehensive assessment of these loopholes, which allow oil and gas companies to continue polluting despite the risks.

Technological solutions that reduce environmental contamination and protect the health of communities across the nation are readily available—and often economical. At a minimum, oil and gas exploration and production should be subject to the same environmental measures with which virtually all other industries must already comply. The time for Congress to step into the regulatory void is long overdue.



[www.nrdc.org/policy](http://www.nrdc.org/policy)

October 2007

© Natural Resources Defense Council

## Drilling Down: Protecting Western Communities from the Health and Environmental Effects of Oil and Gas Production

### The Oil and Gas Industry Is Booming

Along with America's rising national demand for energy, domestic oil and natural gas production has expanded enormously in recent years—and much of this growth is occurring in the Rocky Mountain region. According to the U.S. Energy Information Administration, between 1990 and 2005 the number of producing gas wells nationwide (spread across 32 states) increased from roughly 270,000 to 425,000. The American Petroleum Institute (API) reported that 2006 was a record year for gas drilling, with more than 29,000 new wells drilled. New Mexico, Colorado, Wyoming and Montana are among the states with the greatest growth.

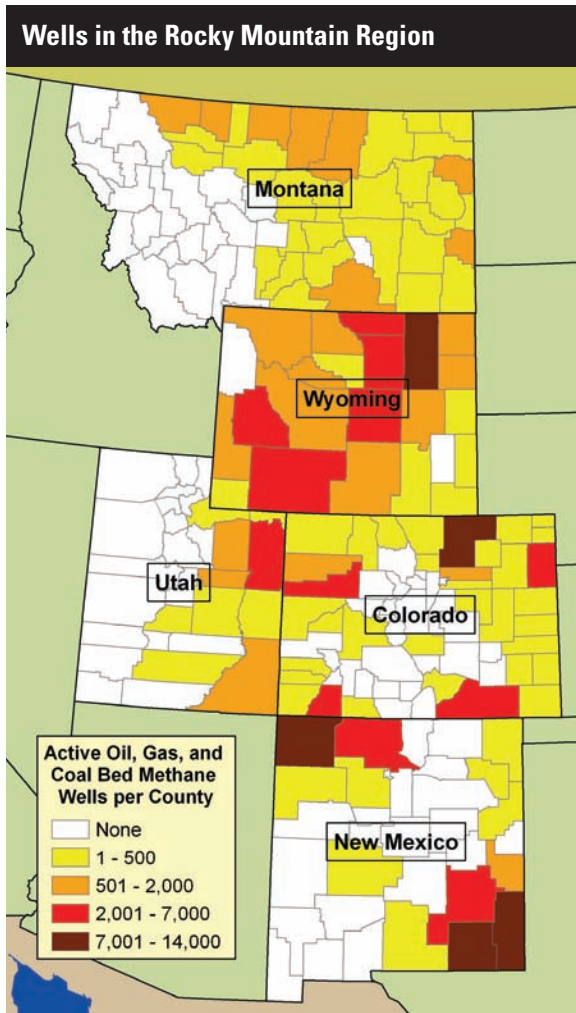
The number of producing oil wells also ranks in the hundreds of thousands. More oil wells were completed in 2006—more than 15,000—than in any year since the 1980s. Expectations that this buildup will continue unabated were confirmed by the API's recent report that oil and gas drilling hit a 21-year high in the first half of 2007.<sup>1</sup>

and birth defects. A recent study reported a higher prevalence of rheumatic diseases, lupus, neurological symptoms, respiratory symptoms and cardiovascular problems in a New Mexico community built on top of a former oilfield with some nearby active wells when compared to a community with no known similar exposures.<sup>2</sup> Other studies have found increased cancer risks associated with living near oil or gas fields.

Among the many symptoms reported by the people whose stories are told in our full report, nausea, numbness, swelling, skin irritation, breathing difficulty, and headaches were frequently cited. A direct cause and effect relationship between possible toxic exposure and the health problems of these individuals has not been determined, but that may be due to the known difficulty of recognizing illness stemming from chemical exposure. Chemical poisoning is notorious for resulting in nonspecific signs or symptoms that resemble other common diseases and immediate symptoms might be nonexistent or mild despite the risk of long-term negative health effects.

Despite some studies on the hazards of oil and gas, there has been no comprehensive scientific monitoring or exposure assessment for an industrial activity present in nearly two-thirds of U.S. states—with more than half a million locations that could be emitting toxic materials to workers and nearby residents. The need for further research is evident.

Some individuals choose not to share their stories, especially in communities with local economies dependent on the oil and gas industry. Others move away, sometimes with their homes purchased by energy companies and with signed agreements that prohibit them from telling their stories. And still others have given up on trying to call attention to this matter. One man recently stated at a public meeting, “if few people are complaining about drilling these days, it's because they've given up after being ignored for so long.”<sup>3</sup>



### People Who Live Near Oil and Gas Operations Report Serious Health Problems

Many people who live near oil and gas operations experience symptoms resembling those that may be caused by the toxic substances found in oil and gas or the chemical additives used to produce them. The negative health effects associated with these substances range from eye and skin irritation to respiratory illness such as emphysema, thyroid disorders, tumors,

For stories of real people affected by oil and gas drilling in the West, see the NRDC full report *Drilling Down: Protecting Western Communities from the Health and Environmental Effects of Oil and Gas Drilling*.

*“The problem of widespread unidentified and unquantified toxic exposure to settled and mobile populations in the drilling fields of the Western Slope is obvious. The fact that no level of government nor any industry group has undertaken these critical health studies is inexcusable. When the bells are tolled for those injured, who will be willing to take the blame for these failures in preventive medicine?”*

Daniel Thau Teitelbaum, MD, medical toxicologist and occupational physician, Adjunct Professor of Environmental Sciences, Colorado School of Mines and Associate Clinical Professor of Preventive Medicine and Biometrics, University of Colorado Health Sciences Center at Denver.

### Legal Loopholes Put People and the Environment at Risk

The network of interrelated exemptions from environmental regulation given to oil and gas companies is a regulatory void unique to the industry. And while some state laws regulate the hazards of oil and gas operations, these laws vary widely. The health of Americans should not be harmed—or even put at risk—by toxic contamination that can be readily and economically controlled.

Decades of deal-making by the industry, Congress, and regulatory agencies have resulted in exemptions for the oil and gas industry from protections in the Clean Air Act, the Clean Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund law), the Resource Conservation and Recovery Act, and the Safe Drinking Water Act. In addition, the oil and gas industry is not covered by public right-to-know provisions under the Emergency Planning and Community Right-to-Know Act, meaning that companies can withhold information needed to make informed decisions about protecting the environment and human health.

## Toxic Chemicals Released During Oil and Gas Operations

Pollutant	Known Negative Health Effects
Arsenic	Chronic arsenic exposure can cause damage to blood vessels, a sensation of "pins and needles" in hands and feet, darkening and thickening of the skin, and skin redness. It is a known human carcinogen, and can cause cancer of the skin, lungs, bladder, liver, kidney, and prostate.
Hydrogen Sulfide	Hydrogen sulfide has been linked to irritation of the eyes, nose, and throat, difficulty in breathing, headaches, dizziness, nausea, and vomiting. Low-level exposure might also lead to poor attention span, poor memory, and impaired motor function. Short-term exposure at high concentrations can lead to loss of consciousness and death.
Mercury	Mercury can permanently damage the brain, kidneys, and developing fetus and may result in tremors, changes in vision or hearing, and memory problems. Even in low doses, mercury may affect an infant's development, delaying walking and talking, shortening attention span and causing learning disabilities.
Polycyclic Aromatic Hydrocarbons	Several of the polycyclic aromatic hydrocarbons (PAHs) that can be found in crude oil have caused tumors in laboratory animals and are considered possible or probable human carcinogens. Studies of people have found that individuals exposed for long periods to mixtures that contain PAHs can also develop cancer. In addition, animal tests have found reproductive problems and birth defects.
Volatile Organic Compounds (VOCs)	
Acetone	Acetone can cause nose, throat, lung, and eye irritation, headaches, light-headedness, and confusion. In animals it has been linked to kidney, liver, and nerve damage, and increased birth defects.
Benzene	Benzene is a known human carcinogen and causes leukemia.
Ethylbenzene	Ethylbenzene can cause dizziness, throat and eye irritation, respiratory problems, fatigue and headaches. It has been linked to tumors and birth defects in animals, as well as to damage in the nervous system, liver, and kidneys.
Toluene	Toluene can cause fatigue, confusion, weakness, memory loss, nausea, hearing loss, central nervous system damage, and may cause kidney damage. It is also known to cause birth defects and reproductive harm.*
Xylene	Xylene can cause headaches, dizziness, confusion, balance changes, irritation of the skin, eyes, nose, and throat, breathing difficulty, memory difficulties, stomach discomfort, and possibly changes in the liver and kidneys.
Radioactive Substances	
Radium	Radium is a known human carcinogen, causing bone, liver, and breast cancer.
Radon	Radon can cause an increased incidence of lung diseases such as emphysema, as well as lung cancer.

\* State of California Environmental Protection Agency, "Chemicals known to the state to cause cancer or reproductive toxicity," (1 June 2007), available at: [http://www.oehha.ca.gov/prop65/prop65\\_list/Newlist.html](http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html).

#### SOURCES:

National Library of Medicine, Hazardous Substances Data Bank (HSDB), <http://toxnet.nlm.nih.gov>

U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), <http://www.atsdr.cdc.gov/toxfaq.html>

U.S. Department of Energy, Office of Environmental Management, Risk Assessment Information System (RAIS), Toxicity Profiles, [http://rais.ornl.gov/tox/rap\\_toxp.shtml](http://rais.ornl.gov/tox/rap_toxp.shtml)

U.S. Department of Labor, Occupational Safety and Health Administration Guidelines, <http://www.osha.gov/SLTC/healthguidelines>

## Drilling Down: Protecting Western Communities from the Health and Environmental Effects of Oil and Gas Production

### Congress Must End Special Favors For Oil and Gas Industry

Despite available methods for controlling hazardous pollution, such as air emission controls and non-toxic or less toxic chemical alternatives, the industry as a whole has failed to take reasonable steps needed to protect families, communities, and the environment. While NRDC strongly supports the voluntary adoption of such technologies by industry, it is imperative that the federal government, in coordination with state and local governments, close the loopholes in federal environmental laws that allow oil and gas exploration and production to pollute our environment and jeopardize the health of communities.

### Recommendations for Protecting Communities from the Risks Associated with Oil and Gas Drilling

#### Close Legal Loopholes

##### ■ Ensure the Public's Right-to-Know

1. Require oil and gas exploration and production companies to report to the Toxic Release Inventory to provide information to the public regarding chemicals that may pose a risk to the health of local communities.

##### ■ Protect the Air

1. Require aggregation of the emissions of oil and gas exploration and production activities under the National Emission Standards for Hazardous Air Pollutants;
2. Include oil and gas wells and their associated equipment on the list of small hazardous air pollutant sources wherever they are located;
3. Add hydrogen sulfide to the list of hazardous air pollutants.

##### ■ Protect Underground Sources of Drinking Water

1. Subject all hydraulic fracturing by the oil and gas industry to the Underground Injection Control program of the Safe Drinking Water Act;

2. Increase daily fines for violations by the oil and gas industry to equal those for other industries;
3. Require that the underground injection of materials associated with the oil and gas industry that meet RCRA's definition of hazardous waste meet the standards of Class I injection.

##### ■ Protect American Waters

1. Delete the term "navigable" from the Clean Water Act;
2. Require stormwater permits for all oil and gas industry activities;
3. Apply the Clean Water Act definition of "pollutant" to all materials used in oil and gas operations.

##### ■ Protect the Land

1. Include all toxic wastes associated with oil and gas exploration and production under RCRA's cradle to grave hazardous waste provisions;
2. Include oil and gas under the Superfund law—CERCLA.

### Evaluate the Health Risks Associated with Oil and Gas Exploration and Production

■ **Ensure extensive independent environmental monitoring** of air, water, and soil that could be affected by oil and gas exploration and production sites.

■ **Assess the toxic exposures of families** living near oil and gas exploration and production sites.

■ **Identify the toxic effects** of the typical chemical mixtures found at oil and gas sites.

■ **Utilize the best available methods to monitor and track health outcomes** in communities and in workers exposed to oil and gas exploration and production activities in comparison with similar but unexposed groups.

■ **Conduct health impact assessments** for oil and gas activities on public land.

<sup>1</sup> American Petroleum Institute, "U.S. drilling & completion half-year estimates at 21-year high" (1 August 2007), <http://www.api.org/Newsroom/drilling-21year-high.cfm>.

<sup>2</sup> Dahlgren, J. et al, "Cluster of systemic lupus erythematosus (SLE) associated with and oil field waste site: a cross sectional study," *Environmental Health* 6, No. 8 (22 February 2007), <http://www.ehjournal.net/content/6/1/8>.

<sup>3</sup> Webb, Dennis, "Houpt: Gasfield residents will be heard," *The Aspen Times* (7 October 2007).