

Do You Believe in Lies?

Smoking improves your health = Fracking for natural gas and oil is Harmless to our air, water, land and food

The oil and gas energy companies operating in Pennsylvania and across the U.S. want you to believe in blatant lies so they can grow richer by continuing and drastically increasing the amount of drilling and fracking they do to get natural gas and oil from the land even though these actions along with their processing and delivery of natural gas release dangerous radioactive elements and toxins into the land, air, rivers, and underground sources of water (such as aquifers and deep water wells) which if they become too polluted will end our ability to live healthy lives.

This relatively new method of oil or natural gas recovery — horizontal drilling followed by high-volume horizontal hydraulic fracturing, known as hydrofracking, or fracking – involves injecting into the ground millions of gallons of water, mixed with sand and highly toxic chemicals, at high pressures to break up rock formations thousands of feet underground and thereby release natural gas and/or oil.

What are the Dangers of Fracking?

1. Believing the lie told by supporters of natural gas fracking that this is a greener fossil fuel energy source.

CO₂ released during the extraction of natural gas adds to global warming. According to the findings of an April 2011 Cornell University study and those of EPA scientists the truth is that the amount of methane [a greenhouse gas that has 105 times more warming impact, pound for pound, than carbon dioxide (CO₂)] released during the fracking process for natural gas is so alarmingly excessive that its levels far exceed the amount of green house gases produced by such fuel sources as conventional gas production, coal and oil. Both EPA and Cornell University scientists conclude that when the extraction process is taken into account natural gas is just as dirty as other fossil fuels.

Neither state nor federal laws require drillers to curb their normally huge emissions of CO₂ and methane in the extraction, processing, and transportation of natural gas.

The only way our society can minimize the consequences of catastrophic global climate change is to use less energy from fossil fuels and use it more efficiently and increase our use of clean, renewable energy sources and end all use of fossil fuels in the near future.

Conventional gas drilling for many decades has had many problems especially with methane migration. But the deep horizontal fracking used to retrieve gas in shale formations like the Marcellus Shale is a newer innovation that is much more harmful. This type of drilling or fracking goes over a mile deep and over a mile horizontally; uses about 67 times more water and toxic chemicals than conventional drilling. Fracking even a single natural gas well consumes about 4 million gallons of water which can be a significant burden on local water tables, rivers and streams. This water use alone has sucked some Pennsylvania streams dry killing off or endangering the wildlife that depended on these waters.

TEDX (The Endocrine Disruption Exchange, Inc.) is a non-profit composed of medical and other scientists that is focused primarily on the human health and environmental problems caused by low dose and/or ambient exposure to chemicals that interfere with development and function, called endocrine disruptors and other industrially-produced chemicals of low concentrations in the environment. The endocrine system is a finely balanced system of glands and hormones that regulates such vital functions as body growth, response to stress, sexual development and behavior, production and utilization of insulin, rate of metabolism, intelligence and behavior.

They have uncovered the following facts:

1. Chemical manufacturers of the products used by gas drillers have total control of how accurately and completely they inform the gas drillers and OSHA of the physical and chemical characteristics of their products as well as their immediate and long term adverse health effects over varying levels of exposure.
2. So far they've identified 980 products that have been used in varying amounts in natural gas fracking.
3. For 421 of the 980 products (43%), less than 1% of the total chemical composition of the product was disclosed by the manufacturer.
4. Less than 50% of the composition was reported for 136 products (14%).
5. Between 51% and 95% of the composition was reported for 291 (30%) of the products.
6. Only 133 products (14%) had information on more than 95% of their full chemical composition.
7. The 980 products have a total of 649 chemicals. Specific chemical names and CAS numbers could not be determined for 286 (44%) of the chemicals, therefore, the health effects summary is based on the remaining 362 chemicals with CAS numbers.
8. Many of these chemicals have adverse health effects in more than 1 of the following 12 health effects categories: Skin, eyes and sensory organ; Respiration; Gastrointestinal and liver; Brain and nervous system; Immune system; Kidney; Cardiovascular and blood; Cancer; Mutagen (causes mutations); Endocrine Disruptors; Other; Ecological.
9. Over 78% of the 362 chemicals harmed the skin, eye or sensory organs and interfered with the healthy functioning of respiration, the liver and the gastrointestinal system.
10. 55% of the chemicals injured the brain and nervous system
11. People experiencing harm in the 4 health effect categories of (see 9. & 10.) are aware of it soon after chemical exposure because they have symptoms like burning eyes, rashes, coughs, sore throats, asthma-like effects, nausea, vomiting, headaches, dizziness, tremors, and convulsions.
12. Between 22% & 47% of the chemicals cause cancer, organ damage, and harm to the endocrine system but these effects may not appear for months or years later.
13. 48% of the chemicals have health effects in the category labeled "Other" and these include outcomes such as changes in body weight, harmful changes to teeth, harmful changes to bones, and the most often cited effect is the ability of the chemical to cause death.
14. To sum up of the 980 products identified thus far in fracking fluids 10% had no health effects and 90% had at least one potentially harmful health effect. 47% of the products contained 1 or

more chemicals considered to be endocrine disruptors. The endocrine system operates at very low concentrations of hormones, often in parts-per-billion (ppb) or less, making it vulnerable to very low levels of chemical exposure, which can impact human and non-human organisms and their offspring. Endocrine disrupting effects include reduced sperm production, infertility, hormone imbalances, and adverse effects on the thyroid, adrenals, pituitary, and more.

15. Of the identified chemicals 210 (58%) are water soluble and 131 (36%) are volatile -- that is they can become airborne.

Through company accidents, spills, legal and illegal dumping of contaminated water, and at each stage of production and delivery of natural gas tons of volatile organic compounds (VOCs), including hydrocarbons benzene, toluene, ethylbenzene, and xylene (as a group called BTEX), as well as other hydrocarbons, and fugitive natural gas (methane), can escape and mix with nitrogen oxides (NOx) from the exhaust of diesel-fueled, mobile and stationary equipment, to produce ground-level ozone. One highly reactive molecule of ground level ozone can burn the deep alveolar tissue in the lungs, causing it to age prematurely. Chronic exposure can lead to asthma and chronic obstructive pulmonary diseases (COPD), and is particularly damaging to children, active young adults who spend time outdoors, and the aged.

Gas field ozone has created a previously unrecognized air pollution problem in rural areas, similar to that found in large urban areas, and can spread up to 200 miles beyond the immediate region where gas is being produced. Ozone not only causes irreversible damage to the lungs, it is similarly damaging to conifers, aspen, forage, alfalfa, and other crops commonly grown in the western United States. Pennsylvania has no regulations that require the monitoring of air quality in the vicinity of gas drilling operations.

There have been many studies in the past few years showing how the public is at risk from the pollutants released by these natural gas fracking operations.

One such research study released in May 2011 was conducted by 4 scientists at Duke University. ProPublica summarized their findings expertly for the benefit of the general public and they include the following:

1. Levels of flammable methane gas in drinking water wells increased to dangerous levels when those water supplies were close to natural gas wells. They also found that the type of gas detected at high levels in the water was the same type of gas that energy companies were extracting from thousands of feet underground, strongly implying that the gas may be seeping underground through natural or man-made faults and fractures, or coming from cracks in the well structure itself.
2. The group tested 68 drinking water wells in the Marcellus and Utica shale drilling areas in northeastern Pennsylvania and southern New York State. Sixty of those wells were tested for dissolved gas. While most of the wells had some methane, the water samples taken closest to the gas wells had on average 17 times the levels detected in wells further from active drilling. The group defined an active drilling area as within one kilometer, or about six tenths of a mile, from a gas well.
3. The average concentration of the methane detected in the water wells near drilling sites fell squarely within a range that the U.S. Department of Interior says is dangerous and requires urgent "hazard mitigation" action, according to the study.

4. Methane contamination of drinking water wells has been a common complaint among people living in gas drilling areas across the country. A 2009 investigation by ProPublica revealed that methane contamination from drilling was widespread, including in Colorado, Ohio and Pennsylvania. In several cases, homes blew up after gas seeped into their basements or water supplies. In Pennsylvania a 2004 accident killed three people, including a baby. Even if the methane does not lead to an explosion it is still dangerous because as it collects in enclosed spaces it can asphyxiate people nearby.

5. In addition to the methane, other types of gases were also detected, providing further evidence that the gas originated with the hydrocarbon deposits miles beneath the earth and that it was unique to the active gas drilling areas. Ethane, another component of natural gas, and other hydrocarbons were detected in 81 percent of water wells near active gas drilling but in only 9 percent of water wells further away. Propane and butane were also detected in some drilling area wells.

6. The geology in Pennsylvania and New York, they said, is tectonically active with faults and other pathways through the rock. They noted that leaky well casings were the most likely cause of the contamination but couldn't rule out long-range underground migration, which they said "might be possible due to both the extensive fracture systems reported for these formations and the many older, uncased wells drilled and abandoned.

As reported by ProPublica and others, 70% to 85% of the toxic fluid used to frack a gas well remains underground. Drillers in PA don't have to supply regulators with a complete list of every chemical they will pump underground, while in New York, state authorities have said that such disclosure is a must because it is essential to protecting the water. In many instances, the high pressure of the fluids being injected into the ground has created leaks of gas - and sometimes fluids - into surrounding water supplies.

In conjunction with the federal government's selling of thousands of mineral leases and its issuance of thousands of drilling permits, the U.S. legislature has granted exclusions and exemptions for oil and gas exploration and production from a number of federal environmental statutes, including the Clean Water Act, the Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, better known as the Superfund Act), the Resource Conservation and Recovery Act (RCRA), the Toxic Release Inventory under the Emergency Planning and Community Right-to-Know Act (EPCRA), and the National Environmental Policy Act (NEPA). The most recent of these efforts was an amendment included in the 2005 Energy Policy Act that prevented the use of the Safe Drinking Water Act to regulate certain activities, known as hydraulic fracturing, which are involved in 90% of natural gas drilling even though up to this point the EPA, under this Act, established minimum standards for state programs to protect underground sources of drinking water from endangerment by underground injection of fluids.

As reported by the New York Times:

In addition to the land and water contamination issues caused by the injection of gas fracking chemicals into the ground. The environmental threat is greatly magnified by the fact that over a million gallons of toxic liquid per hydrofracked gas well can return to the surface as waste containing naturally occurring corrosive salts, carcinogens, heavy metals like arsenic and

cadmium, and radioactive elements in addition to the toxins that were originally put into the ground.

1.3 billion gallons of this toxic flowback fluid or wastewater was created by Pennsylvania gas wells over the past 3 years. Most of this wastewater in Pennsylvania went to sewage treatment plants not equipped to remove many of the toxic chemicals and any of the radioactive materials.

The E.P.A. and **industry researchers** say, the bigger danger of radioactive wastewater is its potential to contaminate drinking water or enter the food chain through fish or farming. Once radium enters a person's body, by eating, drinking or breathing, it can cause cancer and other health problems, many federal studies show.

The Times also found never-reported studies by the E.P.A. and a confidential study by the drilling industry that all concluded that radioactivity in drilling waste cannot be fully diluted in rivers and other waterways.

The risks are particularly severe in Pennsylvania, which has seen a sharp increase in drilling, with roughly 71,000 active gas wells, up from about 36,000 in 2000. The level of radioactivity in the wastewater has sometimes been hundreds or even thousands of times the maximum allowed by the federal standard for drinking water.

In Pennsylvania, these treatment plants discharged waste into some of the state's major river basins. Greater amounts of the wastewater went to the Monongahela River, which provides drinking water to more than **800,000 people** in the western part of the state, including Pittsburgh, and to the Susquehanna River, which feeds into Chesapeake Bay and provides drinking water to more than **six million people**, including some in Harrisburg, Chester County, Delaware County and Baltimore, Maryland.

Lower amounts of gas drilling waste have been discharged into the Delaware River, which provides drinking water for more than **15 million** people in Philadelphia and eastern Pennsylvania.

In late 2008, drilling and coal-mine waste released during a drought so overwhelmed the Monongahela that local officials advised people in the Pittsburgh area to drink bottled water.

E.P.A. officials described the incident in an internal memorandum as "one of the largest failures in U.S. history to supply clean drinking water to the public."

Gas producers are generally left to police themselves when it comes to spills. In

Pennsylvania regulators do not perform unannounced inspections to check for signs of spills. Gas producers report their own spills, write their own **spill response plans** and lead their own cleanup efforts. In 2010 the PA DEP reported 2,486 violations which included explosions, spills and safety hazards.

And prospects for drillers in Pennsylvania are looking brighter.

In December, the Republican governor-elect, Tom Corbett, who during his campaign took more gas industry contributions than all his competitors combined, said he would reopen state land to

new drilling, reversing a decision made by his predecessor, **Edward G. Rendell**. The change clears the way for as many as 10,000 wells on **public land**, up from about 25 active wells today.

In arguing against a proposed gas-extraction tax on the industry, **Mr. Corbett said regulation of the industry had been too aggressive.**

Mr. Corbett and too many of our other politicians have been bought off by the oil and gas industry and therefore don't care about protecting the health of ordinary citizens.

As indicated above our land, air, water wells and major waterways such as the Delaware River and Susquehanna River are under threat of becoming greatly more polluted. Our drinking water treatment plants like Chester Water Authority, Philadelphia Water Department, Aqua Pennsylvania, and Bucks County Water and Sewer Authority use these rivers as sources. Our wells, aquifers and rivers sustain so much wildlife, vegetation, and the crops and farm animals on which we depend that we can do no less than to stop this poisonous industry of natural gas drilling and fracking.

If you want to learn more about fracking and work with others to stop it please contact any of the following organizations:

Delaware County Green Party (Delco Greens) **www.delcogreens.org**
610-543-8427

Protecting Our Waters **<http://protectingourwaters.wordpress.com>**
215-840-6489

Delaware Riverkeeper **www.delawareriverkeeper.org** 215-369-1188

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