New drilling and fracking techniques have made it possible to extract oil and natural gas from shale and other dense rock formations that were previously inaccessible. While such drilling and fracking has been a boon for the oil and gas industry in the United States, it has been a nightmare for Americans exposed to the pollution that accompanies shale development. The expansion of modern drilling and fracking across the country has caused widespread environmental and public health problems and created serious, long-term risks to underground water resources, all of which affect farming and our food.

Fracking takes place primarily in rural agricultural areas, and many farmers have leased their land to the oil and gas industry. Examples of fracking’s negative impacts on agriculture and the food system are emerging. Water contamination from toxic fracking chemicals has sickened and killed livestock, and accidents and spills have contaminated cropland across the country. These incidents could affect consumer confidence in the food produced in these areas. Furthermore, the large quantities of water required for fracking poses a future challenge to agriculture, and the process may contribute to global climate change, which may further strain freshwater resources.

Farmers, whose livelihoods depend on the health of the land, face especially stark choices. Many have leased their land to gas companies with the promise of gas royalty payments and minimal ecological impact. Given the risks associated with fracking, however, there is much at stake. Organic farmers could lose their premium prices if industrial fracking fluid pollutes their crops or livestock, and farm sales could be diminished if pollution threatens livestock, crops or farmland. In contrast to the legacy of environmental pollution that shale development leaves behind, any economic gains from drilling and fracking disappear as the flow of oil and gas declines and drilling and fracking operations move elsewhere.

What Is Fracking?

Hydraulic fracturing, more commonly known as “fracking,” is the process of injecting a mixture of water, sand and chemicals into wells at high pressure to crack dense rock formations and release oil or gas. Advances in drilling and fracking technology have made it possible to extract oil and natural gas from shale and other impermeable rock formations.

Conventional natural gas drilling targets limestone and other rock formations through which gas flows readily. In contrast, unconventional natural gas development targets natural gas held in shale, tight sandstone and coalbed formations, which restrict the flow of natural gas unless they are fracked. Similarly, fracking is essential to free “tight
oil” from otherwise impermeable rock formations so it can
flow into a well. The combination of advanced fracking
and horizontal drilling technologies has made it feasible to
extract large quantities of shale oil and shale gas.

After drilling, developers inject millions of gallons of frack-
ing fluid to crack apart the rock and prop it open so that the
gas can be released. Depending on geology, between 25
and 75 percent of the millions of gallons of frack fluid
used for each well returns to the surface as wastewater.
A large volume of salty water containing naturally occur-
ing contaminants is also typically produced at each well
as wastewater. Combined, these wastewaters contain the
toxic chemicals added to frack fluid, as well as any ra-
dioactive materials and other pollutants leached from deep
underground.

Because natural gas is a relatively clean-burning fossil fuel
compared to oil and coal, it has been touted as a potential
bridge fuel for addressing global climate change and transition-
to a future powered by low-carbon renewable energy
resources. However, recent studies have demonstrated
that increased development of shale gas may actually ac-
celerate climate change because large amounts of methane,
a potent greenhouse gas that makes up 90 percent of shale
gas, leak during fracking. On a global scale, drilling and
fracking result in significant greenhouse gas emissions,
which threaten the climate on which we depend.

Emissions such as volatile organic compounds, benzene
and toluene can be discharged during fracking and are
harmful to public health. These compounds mix with
emissions from heavy-duty truck traffic, large generators
and compressors at well sites to form ground-level ozone.
And water contamination from fracking can and has gravely
impacted farmlands, putting our food sources in peril.

Effects on Agriculture

Water Contamination

There have been many documented cases of contaminated
water affecting livestock. Livestock have consumed contam-
inated water from wells, springs and ponds, causing illness,
reproductive issues and death. Documented incidents
have occurred due to accidents, leaks and spills that result
from negligence, but also as “a consequence of normal
operations.” In other words, fracking is incompatible with
livestock production.

Further complicating the issue, gas companies are not re-
quired to disclose the chemicals used in fracking, and there
are no common procedures for isolating livestock exposed
to chemicals from the food chain. The animals might be
quarantined for a time or not slaughtered for human con-
sumption, but dead animals sent to a rendering plant could
be used for livestock or pet feed.

An overview of livestock exposure to contamination from
fracking found that cows are most likely to be affected,
with the most common exposure from contaminated wells
and springs. Cows exposed to fracking fluids have expe-
rienced difficulty breeding and higher rates of stillborn and
deformed calves. In northwestern Louisiana, 16 cows died
after drinking water that was contaminated with chemi-
cals used in fracking. Chesapeake Energy, the company
involved, refused to disclose further information about the
chemicals, stating the information was “proprietary.” In
a Pennsylvania case, 28 beef cattle were quarantined after
encountering fracking fluid leaking from a wastewater hold-
ing pond. Of the 11 calves born from those cows the fol-
lowing spring, only three survived, a very low survival rate.
Follow-up analysis of the dead calves was inconclusive as
to whether fracking fluid was the cause of death.

In two cases, only part of a herd of beef cattle was exposed
to fracking wastewater. In each case, many of the exposed
cattle died, and those that survived experienced problems
breeding, while the unexposed cattle experienced no
unusual problems. In one herd, the exposed cattle expe-
renced high numbers of stillborn and stunted offspring.
These two cases “approach the design of a controlled
experiment, and strongly implicate wastewater exposure
in the death, failure to breed, and reduced growth rate of
cattle.”

Agricultural Production

Penn State Extension analyzed the impacts of fracking
on dairies in the Marcellus Shale region of Pennsylvania,
where many farmers have leased their land for fracking,
compared to other parts of the state. The study found de-
clining numbers of dairy cows in areas where fracking was
common. In counties with over 10,000 dairy cows, those
with over 150 Marcellus shale wells experienced a 16 per-
cent decline in total dairy cows on average between 2007 and 2010, compared to a 3 percent decline in counties with no Marcellus wells. Researchers speculate a variety of explanations, from farmers using their royalty monies to retire to farmers feeling “forced out” due to the negative effects of wells. Regardless of the reason, a decline in dairy herds yields a negative economic impact on neighboring communities.29

The chemicals that hurt livestock hurt rural residents as well. Water contamination has been identified in over 1,000 cases near oil and gas drilling sites.30 In the first case documented by the federal government, the U.S. Environmental Protection Agency found that well water in Sublette, Wyoming, contained several chemicals associated with fracking,31 including 1,500 times the level of benzene considered safe for drinking.32 Benzene exposure leads to leukemia and other illnesses.33 Multiple residents complained of contaminated wells and mysterious illnesses across the area.34

**Water Use**

Besides contamination, fracking poses a potential source of competition with agriculture for access to fresh water. Modern fracking requires millions of gallons of water for each well, and widespread shale development can compete with essential water needs.35 In Colorado alone, fracking used 4.5 billion gallons in 2010 and is projected to use 6 billion gallons by 2015. In a recent state auction of water rights for 8 billion gallons of water, gas companies acquired 750 million gallons for fracking.36 While the majority of water in the sale went to agriculture,37 fracking increases pressure on water demand in a parched region.

**Consumer Confidence**

As the public becomes increasingly aware of the dangers of fracking, people may grow more skeptical about consuming food from areas where intensive fracking is taking place. For example, the Park Slope Coop in Brooklyn, New York, a retail food cooperative owned by more than 16,000 members, purchases almost $3 million of New York State-produced food products each year. “If the air is fouled and the animals are drinking water that contains poisonous fracking chemicals, then products from those animals are going to have poisons. We would have to stop buying from them. There is no doubt in my mind,” said the manager of the coop.38

**Fracking Hurts Rural Communities**

When farmers and other rural landowners lease their land for fracking, the gains are only temporary, while the damage can be long lasting. Fracking proponents typically do not account for the long-term economic damage and the significant erosion of communities’ quality of life that can outweigh any benefits.39 New oil and gas wells bring fleets of trucks that crowd and damage rural roads and carry potentially hazardous wastewater. New York estimated that if the state allowed shale gas development, each well would require between 890 and 1,350 heavy-duty truckloads.40 Noisy drilling rigs operate 24 hours a day, seven days a week.41 Scenic vistas are replaced with a landscape of gas wells, which lowers property values and harms tourism and recreation industries like hunting and fishing. In Wise County, Texas, properties with gas wells have lost 75 percent of their assessed value.42 Natural gas rigs devalue not only the property where they are located, but also the value of neighboring properties.43

Many of the purported economic benefits are just a mirage — energy companies based elsewhere typically do not buy drilling and fracking supplies from local businesses, and shale development jobs typically go to transient workers who move from shale play to shale play.44 Employment, construction, housing demand and even royalty payments are significant at first, but diminish quickly as well productivity declines and drilling and fracking operations move elsewhere.45 Almost all of the jobs associated with shale development come during the drilling and fracking stage, but it takes less than one year to prepare a well site and conduct the drilling and fracking.46 This means that industry employees, most of whom are transient workers with shale development experience, just move from new well to new well as the number of drilled wells increases.47

**Recommendations**

The rapid expansion of shale gas development and fracking in the United States has resulted in significant environmental and public health problems. Fracking has become an ongoing public health and environmental experiment. Many of these problems are inherent to the practice and cannot be avoided through regulation.
Instead of believing the false promises of the oil and gas industry, we should invest in economic development in rural communities that safeguards our food and water, and we should develop policies that allow farmers to make a fair living farming on their land, instead of making them feel forced to lease it for polluting energy production.

Endnotes


6 Groundwater Protection Council and ALL Consulting at 7, 8 and 15.

7 Ibid. at 15.

8 NPC at 2-33 and 2-34.

9 Groundwater Protection Council and ALL Consulting at 15.


12 U.S. EPA at 43.


18 Ibid. at 1042.

19 Bamberger and Oswald at 58.

20 Ibid. at 55.

21 Ibid. at 67.

22 Ibid. at 64.

23 Ibid. at 59 to 60.

24 Ibid. at 60.


27 Phillips.

28 Bamberger and Oswald at 60.

29 Penn State Extension.


37 Ibid.


45 Phillips Long.

46 Barth; MSETC at 19 and 21.

47 Barth; MSETC at 8.

Food & Water Watch works to ensure the food, water and fish we consume is safe, accessible and sustainable. So we can all enjoy and trust in what we eat and drink, we help people take charge of where their food comes from, keep clean, affordable, public tap water flowing freely to our homes, protect the environmental quality of oceans, force government to do its job protecting citizens, and educate about the importance of keeping shared resources under public control.

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