The oil and gas industry likes to promote fracking as a boon to farmers and rural communities, but the dream often turns into a nightmare. In the United States, fracking has polluted water wells, sickened people and livestock, and reduced available farmland — proving that fracking and a healthy food system are not compatible.

Fracking takes place primarily in rural agricultural areas, and many US farmers have leased their land to the oil and gas industry. Since the fracking boom emerged a few years ago, there have been countless negative impacts on the food system. Fracking fluid spills have sickened and killed livestock and contaminated cropland across the country. These incidents go hand-in-hand with fracking, hurting farmers and affecting consumer confidence in the food produced in these areas. Furthermore, fracking consumes an enormous amount of water and also releases methane, a greenhouse gas, which fuels climate change that may strain future water availability in key agricultural regions.

Farmers, whose livelihoods depend on the health of the land, face especially stark choices. Many who own the rights to the oil and gas beneath their land have leased it to drilling companies for the promise of royalty payments, which they can use to pay down debt or invest in their farming operations. Others who own or rent the surface land but not the minerals beneath have seen well pads, roads and pipelines cross their land with no compensation or recourse. Either way, the problems that fracking brings to communities — competition for land and water, environmental damage, human health impacts — far outweigh fracking’s economic benefits, and persist long after the drilling companies leave.

Effects on Agriculture

Water Contamination

There are numerous documented cases of fracking contaminating drinking water sources. A draft study by the US Environmental Protection Agency (EPA) surveyed several incidents across the United States. Fracking fluid spills at drilling sites have reached surface water. Poorly constructed wells have allowed natural gas to infiltrate aquifers. Faulty pipelines have spilled toxic wastewater into surface and ground water sources. In some regions, contamination may be widespread. In a Texas study, nearly 70 percent of tested water wells located near an oil or gas well tested positive for chemicals associated with exploration, suggesting that drilling may have led to contamination. This is problematic because nearly all rural residents in the United States rely on groundwater for their drinking water, and many farmers also use it to irrigate crops and raise livestock. Contaminated groundwater not only puts these communities’ health in jeopardy, but also impacts their livelihoods. There have been many instances where groundwater contaminated by fracking poisoned livestock, causing illness, reproductive issues and death. However, there are no common procedures for isolating livestock exposed to chemicals.
What Is Fracking?

“Fracking” is short for hydraulic fracturing, the process of injecting a mix of water, sand and chemicals into wells at high pressure to crack rock formations that hold oil or natural gas. Often combined with horizontal drilling techniques, fracking is used to extract oil and gas from shale and other “tight” rock formations.

Fracking companies use hundreds of thousands to millions of litres of water to fracture a single well. For decades, companies have experimented with chemical additives to maximise oil and gas production. Fracking generates enormous volumes of salty, radioactive wastewater that can be difficult and costly to dispose of.

from the food chain; the animals might be quarantined or not slaughtered for human consumption, but dead animals sent to a rendering plant could be used for livestock or pet feed.

An overview of livestock exposure to fracking fluids found that the most common exposure came from contaminated wells and springs. Cows exposed to fracking fluids have experienced difficulty breeding and higher rates of stillborn and deformed calves.

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, whereas the unexposed cattle experienced no unusual problems. According to researchers, 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.”

Pets are also victims. In Pennsylvania, a two-year-old boxer dog had to be euthanised after lapping up fracking wastewater that was intentionally spread on the nearby road.

Frustratingly, without baseline testing of water wells before drilling takes place, it is difficult for farmers to prove that drilling contaminated their water. Baseline testing is not necessarily required by drilling companies, and adequate testing is expensive for farmers to conduct themselves. Additionally, there are at least 692 unique ingredients that have been used in fracking fluids, but baseline tests typically only screen for a limited number of contaminants associated with drilling.

Air Pollution

Drilling, fracking, venting, flaring, wastewater storage and other activities at well sites generate hazardous air pollution. One peer-reviewed study analysed air samples near fracking sites in five US states; nearly 40 percent of samples tested positive for toxic chemicals, such as cancer-causing benzene or formaldehyde, above federal safety standards. Hydrogen sulfide, a deadly gas, was found at levels up to hundreds of times what is considered to be life-threatening.

But Isn’t Natural Gas a “Bridge Fuel”?

The fracking industry and its supporters have long touted natural gas as a “bridge fuel” to a future powered by renewable energy, since burning natural gas release less carbon dioxide than burning oil or coal. However, studies suggest that an abundance of natural gas may increase consumption of the gas, potentially negating these climate benefits. Additionally, natural gas is mostly methane, a potent greenhouse gas. Methane emissions from fracking can offset reductions in carbon dioxide that come from burning natural gas instead of oil or coal. The “bridge fuel” theory may sound promising, but in reality, the industry wants to maintain our dependence on natural gas.
not all states require companies to report to FracFocus.) Farmers can also face increased costs for inputs like land and labour due to increased competition with the drilling industry. Fracking also reduces available farmland. In the Marcellus gas fields of Pennsylvania, well pads and supporting infrastructure (including roads and pipelines) have an estimated footprint of 3.6 hectares per well. When this infrastructure covers farmland, it limits the available space for growing crops and raising livestock.

Oil and gas drilling wastewater is increasingly being used to irrigate crops, including in California where water is scarce. In 2014, half the water used on more than 18,000 hectares in one agricultural region in California was supplied by oil companies. California regulations require wastewater to be treated before use as irrigation, but do not address drilling wastewater specifically. Studies have shown that drilling chemicals can persist in wastewater even after treatment; one study detected methylene chloride—a toxic chemical that affects the nervous system—in treated wastewater at 5 to 11 times the allowed limit in drinking water.

In April 2015, the Central Valley Regional Water Quality Control Board ordered drilling companies with wastewater to test for chemicals related to drilling and to disclose the results to state regulators. One test sample from a Chevron wastewater pond detected benzene, a cancer-causing component of crude oil, at levels nearly 500 times California’s allowed limit in drinking water. However, in other parts of California, irrigation with fracking wastewater may be occurring without additional testing. The extent to which contaminants in the wastewater are being absorbed by plants and entering the food chain remains unknown.

Fracking wastewater is full of toxic materials and salt, and surface spills can be deadly to vegetation. One North Dakota farmer notes that the industry’s wastewater spill from over 50 years ago contaminated 32 hectares of her land, and that land remains unproductive to this day.

Agricultural products from California eventually also find their way to European consumers. Mainly almonds, but also wine, pistachios, walnuts and raisins are exported to EU member states, especially to Germany, Spain and the UK. No fewer than one-third of California’s almond exports are destined for the EU.

**Transportation**

Communities living near oil and gas patches know how drilling booms significantly increase truck traffic. A synthesis of five national and regional studies found that each well development requires an average of 2,200 truck trips. This contributes to traffic jams and wreaks havoc on roadways—as much as €11,000 to €20,000 in costs for each well, according to a Pennsylvania study.

Farmers also compete with drilling companies for cargo shipping capacity. In North Dakota, the rise in oil transport by rail has caused a backlog in shipments of grain, costing farmers money when they cannot get their crops to market.

**Consumer Confidence**

As the public becomes increasingly aware of the dangers of fracking, people are more sceptical about consuming food from areas where intensive fracking is taking place. In 2015, a bill was introduced into the California legislature that would have required the labelling of food that was irrigated by oil and gas wastewater, but the bill died before making it to the floor. Currently there is no requirement to label such crops, creating public concern over potential exposure to a host of toxic chemicals.

Fracking also threatens consumer confidence in organic agriculture, as current USDA organic standards do not explicitly prohibit the use of fracking wastewater for irrigation. This has raised concerns that some organic produce might be irrigated in fracking wastewater. Fracking companies are finding additional ways to infiltrate the food system. In February 2016, Antero Resources announced that it would begin deriving food-grade salt from fracking waste. Such salt could contain radioactive materials and therefore be harmful to health. However, table salt is considered safe by the US Food and Drug Administration (FDA) under the “Generally Recognized as Safe” rule, meaning that companies can process and market salt without FDA review. A professor at the University of Cincinnati College of Law petitioned the FDA for an expert opinion in this matter, hoping that the agency will conclude that salt derived from fracking waste will have to undergo an FDA review before entering the market.

**Fracking Hurts Rural Communities**

When farmers and other rural landowners lease their land for fracking, the gains are temporary, while the damage can be long-lasting. Scenic vistas are replaced with a landscape of drilling pads, which harms tourism and recreation industries like hunting and fishing. Traffic accidents and fatalities double or even quadruple. Home values sometimes increase but can also decline due to fears over contamination of private water sources.

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**Farmer Profile:**

“We’re living in the middle of hell.”

Steve and Jacki Schilke’s cattle ranch is situated in the heart of the North Dakota fracking boom. Since 2008, dozens of fracking wells were drilled within 4.8 kilometres of the Schilke ranch, and the industry also built a waste disposal pit near the family’s home. The Schilke’s watched their dog and cattle fall ill, and Jacki herself began to suffer health issues. The couple began shooting their sick cows to avoid sending potentially contaminated animals to market, hurting their ranch income.
Even after weighing the additional revenue that drilling brings in, local communities sometimes suffer a net loss from oil and gas development. This is because communities must improve roads and other infrastructure worn away by heavy use and also increase spending on emergency, sewer and social services. Additionally, even when the local economy benefits from fracking, these benefits are not evenly distributed across the community, leaving some residents with increased economic insecurity.

Fracking can also impact a farmer’s ability to get financing and insurance. In 2013, Rabobank announced that it will no longer provide loans to farmers who have active shale gas leases, due to its policy of not investing in fossil fuel extraction with unknown risks. In 2012, Nationwide Mutual Insurance (which provides agricultural insurance) issued a statement clarifying that “fracking-related losses have never been a covered loss under personal or commercial lines policies”, citing the difficulties in assessing the risks associated with fracking. Similarly, traditional homeowners’ insurance doesn’t cover earthquakes, a problem for residents of Oklahoma where fracking wastewater disposal is linked to a surge in earthquakes. Even homeowners with earthquake insurance have had their claims denied when the earthquakes were assumed to be human-induced.

Negative impacts are not isolated to communities with active oil and gas wells. Each well requires up to 9,000 tonnes of sand for use in drilling, and frac sand mines exist in the upper US Midwest where fracking is not even taking place. These mines can consume an enormous amount of water and expose nearby communities to harmful silica dust. Additionally, the United States is crisscrossed by 4 million kilometres of pipelines carrying oil, natural gas and other hazardous materials. Accidents are occurring at a rate of nearly two per day, putting farmland and drinking water in danger, including in areas without oil and gas drilling. In one major catastrophe in North Dakota, a pipeline spilled 3.8 million litres of fracking wastewater onto the Fort Berthold Indian Reservation.

**Recommendations**

The rapid expansion of oil and gas fracking in the United States has created significant environmental and public health problems. Many of these problems are inherent to the practice and cannot be avoided through regulation, which is why fracking should be banned.

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. We should also develop policies that allow farmers to make a fair living farming on their land, rather than resorting to leasing their farms for polluting energy production.

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**Endnotes**

14. Ibid. at 64 and 67.
15. Ibid. at 59.
16. Ibid. at 60.
17. Ibid. at 60.
19. Ibid. at 49 to 50.
20. Ibid at 27.
22. Bamberger and Oswald (2014) at 27.
Registry. Ground Water Protection Council and Interstate Oil and Gas Compact Commission. Available at http://www.fracfocusdata.org/Disco
27 Buckel, Amy. “Cimarron National Grassland implemented emergency
28 USDA (2016).
29 US EPA. [Fact sheet]. “Ozone: Good up high, bad nearby.” (EPA-
30 Helms, D. et al. “Highly elevated atmospheric levels of volatile organic
31 USDA Foreign Agricultural Service. “EU-28 Tree Nuts Annual 2015.”
32 USDA. Agricultural Research Service. [Issue brief]. “Effects of ozone air
34 Penn State Extension. [Fact sheet]. “Pennsylvania Dairy Farms and
35 Hitaj, Claudia, Andrew Bosle and Jeremy G. Weber. “Shale development
36 Hitaj, Claudia, Andrew Bosle and Jeremy G. Weber. “Shale development
38 Hitaj, Claudia, Andrew Bosle and Jeremy G. Weber. “Shale development
39 Johnson, Nels. The Nature Conservancy – Pennsylvania Chapter. “Penn-
40 California Code of Regulations § 60304.
41 Go
42 Cart, Julie. “Central Valley’s growing concern: Crops raised with oil
43 Cart, Julie. “Central Valley’s growing concern: Crops raised with oil
44 Cart, Julie. “Central Valley’s growing concern: Crops raised with oil
45 Cart, Julie. “Central Valley’s growing concern: Crops raised with oil
46 Cart, Julie. “Central Valley’s growing concern: Crops raised with oil
48 Helmig, D. et al. “Highly elevated atmospheric levels of volatile organic
49 Harkinson, Josh. “These popular fruit and veggie brands may be grown
50 Joyce, Christopher. “With gas boom, Pennsylvania fears new toxic
51 Nixon, Ron. “Grain piles up, waiting for a ride, as trains move North
52 California State Legislature. ABX2-14. “Food labeling: Wastewater from
53 Harkinson (July 2015).
55 Harkinson, Josh. “There might be fracking wastewater on your organic
56 Mezo, Ingrid. “FDA asked if fracking sludge can be processed into salt.”
57 Ibid.
59 Mezo (2016).
60 Clark, Megan. “Highway fatality rates quadruple over 10 years in oil-
61 Muehlenbachs, Lucija, Elisheba Spiller and Christopher Timmins. “The
62 Jones, Corey. “‘Extraordinary denial rate’ of 9 in 10 earthquake claims
63 Scha
64 Cockerham, Sean. “Oil boom a loser for North Dakota cities, counties,
65 Minnesota Department of Natural Resources. Division of Lands and
66 Minnesota Department of Natural Resources. Division of Lands and
67 National Association of Insurance Commissioners and the Center for
68 Jones, Corey. “‘Extraordinary denial rate’ of 9 in 10 earthquake claims
69 Minnesota Department of Health (MDH). [Fact sheet]. “Silica Sand Min-
70 Minnesota Department of Health (MDH). [Fact sheet]. “Silica Sand Min-
71 US Government Accountability O