

WASTE: The Soft & Dirty Underbelly of Fracking

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Drilling and fracking a single shale well can produce millions of gallons of toxic wastewater and hundreds of tons of potentially radioactive solid waste. Disposal of these wastes poses serious environmental and public health risks.

The Fracking Nightmare

New drilling and fracking technologies have made it feasible to extract large amounts of oil and gas from shale and similar underground rock formations.¹ While this shale development has been a boon for the oil and gas industry, it has been a nightmare for communities living with the water pollution, air pollution, explosions and fires, and ruined landscapes. Fracking for oil and gas also contributes to climate-threatening levels of greenhouse gas emissions.

Rivers of Toxic Wastewater

To frack a shale gas well, millions of gallons of fracking fluid — a blend of water, sand and chemicals — are pumped underground at high pressure to break up shale rock, allowing gas to flow into the well.² The technology for shale oil development is essentially the same.³ Some of the fracking fluid stays underground indefinitely and the rest flows back up out of the well, mixed with naturally contaminated waters from deep below ground.⁴

Fracking wastewater contains numerous chemical additives, many of which are far from safe:

- Known and suspected carcinogens that have been present in fracking fluids include naphthalene, benzene and acrylamide.⁵ Other environmental toxins present in some fracking fluids, such as toluene, ethylbenzene and xylenes, can result in nervous system, kidney and/or liver problems.⁶
- Since fracking fluid recipes are proprietary, and since there is no federal requirement for disclosure, fracking fluid can contain unknown chemical additives.⁷ This means the full threat of fracking wastewater is also unknown.



Fracking wastewater contains potentially extreme levels of often naturally occurring but harmful contaminants that are brought to the surface:

- Harmful contaminants can include arsenic, lead, hexavalent chromium, barium, strontium, benzene, polycyclic aromatic hydrocarbons, toluene, xylene, corrosive salts and naturally occurring radioactive material, such as radium-226.⁸

The *New York Times* reviewed documents on gas wells in Pennsylvania and West Virginia and found that at least 116 wells produced wastewater with radiation levels that were a hundred times the U.S. EPA's drinking water standard; at least 15 of these wells had wastewater at more than a thousand times the standard.⁹

Since conventional treatment facilities are not equipped to treat radioactive material and other contaminants in fracking wastewater, many of these contaminants simply flow through conventional treatment facilities and get discharged into public rivers and streams.¹⁰ This could contaminate drinking water supplies for downstream communities and could harm aquatic life essential to sustaining recreational and commercial fisheries.

Researchers at the University of Pittsburgh tested water being discharged, after treatment, into a creek from a facility in Pennsylvania and found average concentrations of benzene at twice the U.S. EPA's drinking water standard, barium at 14 times the standard, total dissolved solids at 373 times the standard, strontium at 746 times the EPA's recommended level for drinking water and bromide at 2,138 times the level that triggers regulatory reporting requirements under the treatment plant's permit in Pennsylvania.¹¹

Bromides cause particular problems for downstream drinking water utilities. Bromides can react during water treatment to form brominated trihalomethanes, which are linked to cancer and birth defects and which are difficult to remove once they've been added to drinking water supplies.¹²

Mountains of Toxic Waste

New York estimated that drilling a typical shale gas well would generate about 5,859 cubic feet of rock cuttings — enough to cover an acre of land more than 1.5 inches deep.¹³ These cuttings, about the size of coarse grains of sand, are coated with used drilling fluids that can contain contaminants such as benzene, cadmium, arsenic, mercury and radium-226.¹⁴

Dumping this toxic waste in landfills could expose workers to harmful levels of some of these environmental toxins.¹⁵ Radium-226 contamination would persist for more than a thousand years after the landfill closed, ruining the productivity of the land for many generations.¹⁶

Dumping loads of drilling cuttings in landfills could lead to operational problems as well. The landfill linings could be degraded, resulting in leaks of radioactive material and other harmful contaminants.¹⁷ Also, layers of drilling cutting wastes could plug up the flow of landfill fluids, causing spills out the sides of the landfill.¹⁸

Take Action

Fracking wastes are clearly hazardous, yet they are not regulated as hazardous waste under federal law.¹⁹ Disposing of these wastes by injecting them deep below ground is believed to have caused numerous earthquakes, and such disposal can also mean the wastes are hauled long distances over public roads, risking accidents and spills.²⁰ If the oil and gas industry succeeds in bringing drilling and fracking to new areas of the country, the problems with disposing of these wastes will only grow.

To find out how you can help the nationwide effort to ban fracking, visit:
www.foodandwaterwatch.org

Endnotes

- 1 National Petroleum Council. "Prudent Development: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources." September 2011 at 192 and 193.
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- 3 National Petroleum Council. September 2011 at 192.
- 4 United States Environmental Protection Agency. November 2011 at 15 and 23, 42 and 43.
- 5 United States House of Representatives. Committee on Energy and Commerce. [Minority Staff Report]. "Chemicals used in hydraulic fracturing." April 2011 at 9.
- 6 *Ibid.* at 10.
- 7 *Ibid.* at 4.
- 8 Urbina, Ian. "Regulation lax as gas wells' tainted water hits rivers." *The New York Times*. February 26, 2011; 76 U.S. Fed. Reg. 66286, 66296 (October 26, 2011); Mall, Amy and Dianne Donnelly. Natural Resources Defense Council. "Petition for Rulemaking Pursuant to Section 6974(a) of the Resource Conservation and Recovery Act." September 8, 2010 at 8 to 9.
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- 11 Volz, Conrad Daniel. Center for Healthy Environments and Communities, University of Pittsburgh Graduate School of Public Health. Testimony on Natural Gas Drilling, Public Health and Environmental Impacts. Subcommittee on Water and Wildlife. Committee on Environment and Public Works. United States Senate. April 12, 2011 at 4 to 6.
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- 13 New York State Department of Environmental Conservation. "Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program: Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs." September 7, 2011 at 5-34.
- 14 Resnikoff, Marvin et al. Radioactive Waste Management Associates. [Report prepared for Residents for the Preservation of Lowman and Chemung]. "Radioactivity in Marcellus Shale." May 19, 2010 at 7; Mall and Donnelly. September 8, 2010 at 10.
- 15 Resnikoff et al. May 19, 2010 at 7 to 8.
- 16 *Ibid.* at 7 to 8.
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- 18 North Carolina Departments of Environment and Natural Resources, Commerce, and Justice and RAFI-USA. [March 2012 at 189 to 190.
- 19 Mall and Donnelly. September 8, 2010 at 7, 37 to 41.
- 20 Soraghan, Mike. "Wastewater injection well sparked earthquake — Ohio officials." *E&E Publishing, LLC*. March 9, 2012; Niquette, Mark. "Ohio tries to escape fate as a dumping ground for fracking fluid." *Bloomberg*. February 1, 2012.

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