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Many thanks to the Senate Democratic Committee for holding this forum and the opportunity to speak today. Particular thanks go to Senators Tkaczyk, Gipson, Krueger, and Avella for sponsoring bills to address the very real risks of oil and gas field waste.

Founded in 1988, Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the impacts of irresponsible mineral and energy development. I am a lifelong New Yorker and currently reside in Woodstock in Ulster County.

New York has rightly delayed shale gas production within its borders because of concerns for health and the environment—concerns that are increasingly legitimized by scientific research and realities on the ground nationwide. The handling and treatment of oil and gas field waste also demands the same concern and caution, as it is contaminated with salts, chemicals, heavy metals, radioactive material, and other toxic and polluting substances.

But there is one crucial difference: fracking waste already exists in New York, and the risks are increasingly real as the Marcellus shale gas boom proceeds along our borders. The volume of solid and liquid waste being created through fracking operations is surging. In Pennsylvania alone, Marcellus Shale drillers reported a 70 percent increase in wastewater generated just between 2010 and 2011, when the volume reached 613 million gallons.[1]

Twenty-five years ago, the EPA determined that oil and gas exploration and production wastes would receive a categorical exemption from the Resource Conservation and Recovery Act.[2] At the time, EPA stated clearly that some oil and gas waste would be deemed hazardous were it not for the exemption. Since most states have incorporated this loophole for polluters into their own oil and gas regulations, they don't have the systems and regulations in place to adequately treat waste and prevent pollution. Unfortunately, this outdated and risky state of affairs also exists in New York.

In the meantime, the old proverb "necessity is the mother of invention" comes to mind. Oil and gas operators are trying to create new ways to use waste and are willing to go further afield to get rid of it.

Drillers in Pennsylvania and Texas hope to create new products from drill cuttings, such as road base and construction materials.[3] Last summer, a shipment of highly radioactive waste was trucked all the way from Pennsylvania to Idaho before it could be disposed of at a specialized facility.[4] According to the Pennsylvania Department of Environmental Protection (DEP), waste is currently shipped to seven different states. In New York, nine landfills and six waste management facilities currently accept drill cuttings, wastewater, and used frac sand from Pennsylvania.[5]

Another saying comes to mind as the industry tries "to make a silk purse out of a sow's ear." No matter what drillers and regulatory agencies wish to believe about oil and gas field waste, and no matter how its packaged, its toxic nature remains. Nor have they demonstrated that current methods of waste treatment and disposal can sufficiently protect water, vegetation, soil, and health.

But there *is* mounting evidence of the risks:

- Recent tests on water leaching from a West Virginia landfill showed spiking levels of radioactivity up to 40 times the state's clean drinking water standard.[6]
- Radiation detectors triggered alarms at Pennsylvania landfills over 400 times in 2008 and 1300 times in 2012, with more than two-thirds of such events attributable to oil and gas wastes.[7]
- A 2012 investigation by the Pennsylvania DEP found chloride, bromide, lithium, strontium, radium-226, and radium-228 downstream of a wastewater treatment plant in the Allegheny River, a drinking water supply for Pittsburgh. The agency concluded that the discharges are "harmful to water uses and aquatic life."[8]
- A 2013 study by Duke University found high levels of radium, salts, bromide, and metals in a western Pennsylvania stream just below a wastewater treatment plant discharge.[9]
- In 2011, the U.S. Geological Survey found that median radium levels in wastewater from oil and gas wells in New York and Pennsylvania were 500 times the federal safe drinking water standards.[10] Yet early this year, researchers at the University of Iowa and other institutions found that tests used on Marcellus Shale drilling wastewater actually underestimate radium levels.[11]
- In 2009, an analysis of flowback in West Virginia and Pennsylvania detected barium and known carcinogens such as benzene, toluene, ethylbenzene, and xylene far above the thresholds considered to be safe under the law.[12]
- In 2011, in commenting on New York's draft shale gas drilling plan, the U.S. Environmental Protection Agency Region II office said that the Department of Environmental Conservation was understating the radioactivity of drill cuttings, and it was unclear which agency was responsible for ensuring proper controls at landfills that accept the material.[13]

By ignoring the hazardous and toxic nature of the waste coming into New York—and the inability of landfills and publicly owned treatment works (POTWs) to adequately treat it—officials are allowing a game of roulette to be played with water and health. Many New York counties know this and have decided not to even gamble. Instead, they have passed measures to prohibit the acceptance of hydraulic fracturing waste at POTWs and the spreading of fracking brine on roads for de-icing.

It is high time for New York's state legislators to listen, hear, and follow suit. Earthworks and its partners strongly encourage the passage of bills that have been introduced in both the Senate and Assembly to close the hazardous waste loophole, prohibit POTWs and landfills from accepting gas and oil field waste, and to prohibit such waste from being spread on roads.

Thank you for your time and attention to these critical concerns.

[1] E. Hansen, D. Mulvaney, and M. Betcher. *Water Resource Reporting and Water Footprint from Marcellus Shale Development in West Virginia and Pennsylvania.* Downstream Strategies and San Jose State University, 2013. This report also documented that reuse and recycling of flowback fluid makes up only 8% of recent water use in West Virginia and 14% in the Susquehanna River Basin in Pennsylvania, despite industry claims that they will soon be able to vastly reduce both freshwater use and the volumes of wastewater generated.
[2] U.S. Environmental Protection Agency. "Regulatory Determination for Oil and Gas and Geothermal Exploration, Development, and Production Wastes." Federal Register Volume 53, 1988. www.epa.gov/osw/nonhaz/industrial/special/oil/og88wp.pdf.
[3] General Permit Application No. WMGR097R025, Range Resources-Appalachia, LLC. *Pennsylvania Bulletin,* February 1, 2014; and Jennifer Hiller, "Drilling waste finds a new use," *My San Antonio,* May 4, 2013, www.mysanantonio.com/business/article/Drilling-waste-finds-a-new-use-4487533.php.
[4] Tara Kinsell. "Rejected frack waste taken to Idaho," *Observer Reporter,* July 11, 2013. www.observer-reporter.com/article/20130711/NEWS02/130719870/-1/NEWS
[5] Pennsylvania Department of Environmental Protection, PA DEP Oil & Gas Reporting Website, Waste Reports, By Waste Facility (April 24, 2014), https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Waste/WasteByWasteFacility.aspx.
[6] Public News Service, "Marcellus waste radioactivity in water leaching from landfills," April 21, 2014. www.publicnewsservice.org/2014-04-21/environment/marcellus-waste-radioactivity-in-water-leaching-from-landfills/a38864-1.
[7] Timothy Puko, "Radioactive fracking debris triggers worries at dump sites," *Pittsburgh Tribune Review*, May 11, 2013.
[8] Consent Decree, PA Department of Environmental Protection v. Waste Treatment Corporation. Filed in the Commonwealth Court of Pennsylvania, November 25, 2013.
[9] N.R. Warner, C.A. Christie, R.B. Jackson, A. Vengosh "Impacts of Shale Gas Wastewater Disposal on Water Quality in Western Pennsylvania." *Environmental Science & Technology,* 2013.
[10] U.S. Environmental Protection Agency, "Basic Information About Radionuclides in Drinking Water" (Dec. 3, 2013), http://water.epa.gov/drink/contaminants/basicinformation/radionuclides.cfm.
[11] Andrew W. Nelson, Dustin May, Andrew W. Knight, et al. "Matrix Complications in the Determination of Radium Levels in Hydraulic Fracturing Flowback Water from Marcellus Shale," *Environmental Science and Technology* (Feb. 10, 2014), http://pubs.acs.org/doi/pdf/10.1021/ez5000379.
[12] T. Hayes. *Sampling and Analysis of Water Streams Associated with the Development of Marcellus Shale Gas.* Gas Technology Institute; report prepared for the Marcellus Shale Coalition. December 2009. http://energyindepth.org/wp-content/uploads/marcellus/2012/11/MSCommission-Report.pdf
[13] U.S. Environmental Protection Agency, Region II. Comments on Revised Draft NYSDEC Revised dSGEIS for Horizontal Drilling and High- Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs, Jan. 11, 2012.