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November 17, 2010

President Barack Obama
The White House
1600 Pennsylvania Avenue NW
Washington, D.C. 20500

Dear Mr. President:

We are writing to you on behalf of our more than ten thousand members who are deeply concerned about the threat that unconventional shale gas extraction poses to our environment and to public health. While there is no doubt that the United States has abundant shale gas reserves, this valuable resource must be exploited in a way that does not create a public health menace or an environmental disaster. To achieve this goal, it is imperative that our federal government develop a clear, consistent energy policy based on science, not political considerations.

The preferred technology that is being used to extract shale gas is high-volume hydraulic fracturing (HVHF), also known as "fracking." HVHF is inherently dangerous, poorly understood, and inadequately regulated; it has already been linked to over one thousand instances of water contamination throughout the country.[1]

Fracking even a single gas well entails injecting millions of gallons of fluid into the ground to create enough pressure to fracture the rock and release the gas it contains.[2] Fracking fluid is primarily water, but also contains hundreds of chemical additives, including neurotoxins and carcinogens, that are hazardous in parts per billion.[3] If America's shale gas reserves are developed using these chemical fracturing fluids, trillions upon trillions of gallons of toxic fluid will be injected underground—and most of it will never be recovered.[4]

At present, no one can say with any degree of certainty that these fluids will not present a threat to our drinking water supplies—either immediately or in the years and decades to come.

A May 2009 United States Geographical Survey noted

> While the technology of drilling directional boreholes, and the use of sophisticated hydraulic fracturing processes to extract gas resources from tight rock have improved over the past few decades, *the knowledge of how this extraction might affect water resources has not kept pace.*

> *Agencies that manage and protect water resources could benefit from a better understanding of the impacts that drilling and stimulating Marcellus Shale wells might have on water supplies. . . .* [5] [Emphasis added]

Proponents of HVHF like to claim that there have been over one million fracking operations in the United States without a single instance of drinking water contamination, but this assertion is not based on empirical data, and in fact there have already been a great many instances where drinking water supplies have been compromised after hydraulic fracturing has taken place. In some instances, water wells have run dry, or have been contaminated with total dissolved solids (TDS) or methane. In other instances, such as in Pavilion, Wyoming, and Dimock, Pennsylvania, the chemical constituents of the fracking fluid itself have been detected in drinking water.

To date, there has never been a single credible peer-reviewed study of the effect of hydraulic fracturing on our drinking water supplies[6] and it is to your great credit that EPA Administrator Lisa Jackson initiated just such a study earlier this year. The results of that study will not be known until 2012.

As of now, a report prepared by the environmental engineering firm of Hazen & Sawyer for the New York City Department of Environmental Protection may be the most thorough consideration of the subject, and it findings are anything but reassuring.

> *Subsurface migration of fracturing fluids or formation water and pressures could present risks to potable water supplies if such fluids were to intercept a shallow fresh water aquifer . . . Potential migration pathways include migration of fracturing and formation fluids along the well bore as well as migration across and out of the penetrated and hydraulically fractured strata.*[5]

The report also described the geological conditions that were encountered during the construction of New York City's water tunnels, which pass through the Marcellus Shale, a region that is now targeted for fracking:

> Brittle geological features such as faults, fractures and crushed zones were encountered during water supply tunnel construction. Groundwater inflows were also encountered at numerous locations during tunnel construction, and in several cases, these align with mapped faults, fractures or linear features. More importantly, *saline, methane, and hydrogen sulfide seeps were encountered as well. These seeps are considered to be indicative of a hydraulic connection to naturally-occurring pressurized groundwater/fluids from much deeper strata. Existing connections to deeper strata can transmit pressurized fluids (e.g., saline and/or radioactive formation water and residual hydrofracturing chemicals) upward to the vicinity of the fresh water aquifer . . .* [7] [Emphasis added]

In addition to the risk associated with the underground injection of toxic fracturing fluids, a number of other impacts associated with shale gas extraction may adversely affect drinking water supplies.

Wastewater disposal is a problem that has not been adequately addressed. In addition to the spent fracking fluid that is recovered from fractured wells, vast quantities of so-called "produced water" are disgorged along with the natural gas. Produced water is a naturally occurring solution that contains high levels of chlorides, total dissolved solids (TDS), toxic metals such as cadmium, and radioactive material including radon and radium.[7] At present there are few, if any, wastewater treatment plants that can remove all these contaminants from drilling wastewater so that it can be safely discharged into our rivers and streams. In 2008, Pennsylvania had to temporarily halt the disposal of partially treated drilling wastewater into the Monongahela River because the level of pollutants was so high that it was damaging industrial equipment and befouling the drinking water of hundreds of thousands of state residents.[8] The trucking of toxic wastewater over long distances poses an additional hazardous threat, there are numerous recorded incidents --- due to leakage, poorly maintained trucks, accidents, and driver error.

Also, the notion that shale gas can be used to reduce greenhouse emissions needs to be carefully scrutinized. Current gas extraction technology is heavily reliant on diesel fuel, because millions of gallons of fresh water and wastewater have to be trucked to and from each well site, often over long distances. Moreover, large quantities of volatile, organic compounds are typically released into the atmosphere during the extraction process, and significant amounts of the natural gas escape as it is transmitted from the well head to the consumer. In a report recently submitted for peer review, Cornell Professor Robert C. Howarth says:

> *We urge caution in viewing natural gas as good fuel choice for the future. Using the best available science, we conclude that natural gas is no better than coal and may in fact be worse than coal in terms of its greenhouse gas footprint when evaluated over the time course of the next several decades.* Note that both the National Academy of Sciences and the Council of Scientific Society Presidents have urged great caution before proceeding with the development of diffuse natural gas from shale formations using unconventional technology.[9] [Emphasis added.]

In addition to the many unanswered questions about the technology used to extract shale gas, the regulatory framework that governs the process is grossly inadequate. The 2005 Energy Act exempted hydraulic fracturing from important provisions of many environmental laws, including the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act. And regulation at the state level is also lacking; in fact most states where hydraulic fracturing takes place have no regulations whatsoever to govern the process.[10]

Finally, the entire business model of shale gas extraction must be carefully evaluated. Hydraulic fracturing is an expensive proposition, and it is not clear that tapping our shale

gas reserves using today's technology makes economic sense. The profitability of the enterprise depends in large part on substantial financial incentives from the federal government and the industry's ability to externalize many of its business costs. All too often, host communities are burdened with expensive road repairs and the cost of paying for the additional emergency medical services and law enforcement necessitated by the sudden influx of a transient worker population engaged in a new and dangerous industrial activity. Residents who live near hydraulically fractured wells must pay for multiple well water tests that can cost more than five hundred dollars each. In addition, permitting fees and taxes on production are, in many instances, insufficient to pay for adequate regulation or the high cost of cleaning up after wells are exhausted or environmental accidents have occurred.

Sustainable energy sources such as the wind, sun, and tide are by their very nature non-polluting, and the technology that captures these resources has a relatively small carbon footprint and very little risk of environmental disaster. Before investing further in shale gas technology, the federal government should conduct a careful and comprehensive risk/rewards assessment that compares shale gas extraction with renewable energy sources. If the billions of dollars that now subsidize the fossil fuel industry were used to develop sustainable energy, could the United States generate as much per capita solar energy as Germany? Could we compete with Portugal in harvesting energy from the tide and the waves? Would the United States, instead of China, emerge as the leader in green energy technology?

America's ability to innovate is unrivalled, and it may well be that in the future we are able to utilize our shale gas reserves without putting public health and our environment at risk, but it is not at all clear that we can achieve this goal using today's technology. As your administration charts our energy policy for the future, we ask you to make decisions that are grounded in science and that put the welfare of the public ahead of corporate interests.

Thank you for your careful consideration of these urgent matters.

Sincerely,

Bruce Ferguson
Catskill Citizens for Safe Energy

Ramsay Adams, Executive Director
Catskill Mountainkeeper

Cc: Lisa P. Jackson, EPA Administrator
Steven Chu, Energy Secretary
Ken Salazar, Interior Secretary
Judith Enck, EPA Administrator, Region 2

1. A series of investigations by ProPublica found that "fracturing is the common thread in more than 1,000 cases of water contamination across seven states." *EPA Launches*

*National Study of Hydraulic Fracturing* ProPublica, March 18, 2010." See also: "Impacts and Incidents Involving High-Volume Hydraulic Fracturing From Across the Country," by Riverkeeper, Inc. http://catskillcitizens.org/learnmore/RIVERCASES.PDF and "Incidents where hydraulic fracturing is a suspected cause of drinking water contamination," by Amy Mall. http://switchboard.nrdc.org/blogs/amall/incidents_where_hydraulic_frac.html

2. At a Common Waters Meeting in Narrowsburg, N.Y., on February 10, 2010, Brian Grove, director of corporate development for Chesapeake Energy, stated that his company's Marcellus wells in Pennsylvania require an average of five million gallons of fracking fluid each time a well is fracked. That figure that is roughly in line with other estimates.

3. "Chemicals Used in Natural Gas Production", The Endocrine Disruption Exchange. See also "The Safety of Fracturing Fluids—A Quantitative Assessment," by Steve Coffman, August 4, 2009. http://catskillcitizens.org/learnmore/coffmanfrack.pdf

4. At the above referenced Commons Waters Meeting in Narrowsburg, N.Y., Chesapeake's Brian Grove stated that his company's Marcellus wells in Pennsylvania require an average of five million gallons of fracking fluid, and that four million gallons of the fluid are never recovered. The wastewater treatment company ProChem Tech, in a report entitled. "Marcellus Gas Well Fracture Wastewater Recycle and Water Supply," estimates that 60 to 90% of injected fluids are recovered. In 2008, the New York Department of Environmental Conservation collected information from drillers on the hydraulic fracturing of shale formations. Data supplied by the gas companies showed recovery rates of between 20 and 50%, meaning that 50% to 80% of the fracking fluid remains unrecovered. In a private communication on September 15, 2009, Brad Gill, executive director of the New York Oil and Gas Association, states " . . . on the order of 10 to 30% initial recovery is being seen. Then, as the well is produced, additional fluids can be recovered . . ."

5. "Water Resources and Natural Gas Production from the Marcellus Shale," by Daniel J. Soeder and William M. Kappel. A USGS report, May 2010. http://pubs.usgs.gov/fs/2009/3032/pdf/FS2009–3032.pdf page 5.

6. The only peer-reviewed study of hydraulic fracturing, "Study to Evaluate the Impacts to USDWs by Hydraulic Fracturing of Coalbed Methane Reservoirs," has been widely discredited for the suppression of troubling data, the methodology employed, the haste with which it was done and appearance of conflicts of interest among the reviewing scientists. See "EPA Findings on Hydraulic Fracturing Deemed 'Unsupportable' by the Union of Concerned Scientists" (http://www.ucsusa.org/scientific_integrity/abuses_of_science/oil-extraction.html) and the letter to Congress by EPA environmental engineer Weston Wilson, October 8, 2004, http://catskillcitizens.org/learnmore/WILSONLETTER.PDF.

7. "Final Impact Assessment Report: Impact Assessment of Natural Gas Production in the New York City Watershed," Hazen & Sawyer Environmental Engineers and Scientists, December 2009, page 57.

8. *Pennsylvania DEP Secretary: New Treatment Plant Showcases Technology to Meet Stronger, Greatly Needed Water Quality Standards,* PR Newswire, Jun 11, 2010. See also *DEP hopes a flush cleans Mon water, by* Don Hopey, Pittsburgh Post-Gazette, October 24, 2008.

9. Assessment of the Greenhouse Gas Footprint of Natural Gas from Shale Formations Obtained by High-Volume, Slick-Water Hydraulic Fracturing, by Robert W. Howarth, David R. Atkinson Professor of Ecology & Environmental Biology, Cornell University (*November 15, 2010*)

10. *Energy Industry Sways Congress with Misleading Data*, by Abrahm Lustgarten, ProPublica, July 8, 2009.