



DEPARTMENT OF NATURAL RESOURCES
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July 2, 2009

VIA MAIL

The Honorable Mark Udall
United States Senator
B40E Dirksen Senate Office Building
Washington, DC 20510

The Honorable Michael F. Bennett
United States Senator
702 Hart Senate Office Building
Washington, DC 20510

The Honorable John Salazar
United States Congressman
326 Cannon HOB
Washington, DC 20510

Dear Senator Udall, Senator Bennett and Representative Salazar:

This is in response to your letter of June 3, 2009 regarding the ongoing development of oil and gas resources in the general vicinity of Project Rulison and the steps taken by the Colorado Oil and Gas Conservation Commission ("COGCC") to ensure that the environment and public health, safety, and welfare are protected.

Background

As you know, Project Rulison was a 1969 underground nuclear blast conducted by the Atomic Energy Commission ("AEC") to investigate the use of nuclear explosives to stimulate gas production. It involved the detonation of a 40 kiloton nuclear device approximately 8,400 feet deep at a site about 40 miles from Grand Junction. Detonation of the device created a cavity in the rock which contained approximately 170 million cubic feet of gas and fractured the surrounding rock. In 1970, a test well was drilled back into the cavity to evaluate the effect of the blast, and approximately 450 million cubic feet of gas was produced from the cavity and surrounding rock. In 1976, the test well was plugged and abandoned. The federal government has established a 40-acre area around the blast site, called Lot 11, within which drilling is prohibited below 6,000 feet. Annual sampling of wells, springs, and streams in the Rulison area has been conducted by the Environmental Protection Agency since the time of the test, with no

radionuclides detected above background. Other monitoring and environmental studies have been conducted by the AEC, U.S. Geological Survey, Department of Energy (“DOE”), Colorado Department of Public Health (“CDPHE”), and the Desert Research Institute.

The COGCC has taken various actions over the years to ensure that oil and gas development in the general vicinity of the Project Rulison blast site will protect the environment and public health, safety and welfare. In 1998, the COGCC prepared an extensive review of the Project Rulison literature, which found little possibility of encountering radioactive gas during drilling operations outside of Lot 11, that is, more than approximately 325 feet from the blast site. Nevertheless, the COGCC determined that all applications for drilling permits (“APDs”) within three miles of the blast site would be forwarded to DOE for review and comment; a three mile area was adopted for this purpose because, as of 1998, no active or proposed wells were located within that area. Thereafter, the COGCC has imposed on permits issued within the three mile zone four special conditions requiring radionuclide monitoring, special conductor pipe, special wellbore surveys, and compliance with DOE sampling requests.

In 2004, the COGCC further directed that any APDs for locations within one-half mile of the blast site would require a formal COGCC hearing. No APDs have ever been approved for locations within one-half mile of the blast site. To date, only one APD has been filed for such a location, and it was withdrawn prior to COGCC action.

In response to increasing numbers of APDs filed for locations within the three mile zone, the COGCC conducted a three-hour public information session on Project Rulison in Grand Junction in October 2007, which included presentations by the COGCC staff, CDPHE, and DOE, as well as extensive opportunity for public comment. The COGCC staff also undertook a further review of the environmental and public health issues, which included consultation with CDPHE, and work by two independent firms, S.S. Papadopoulos & Associates, Inc. and M.H. Chew and Associates. The individuals involved had more than 200 years of professional experience, including experience with hydrology, geohydrology, geochemistry, health physics, radiation regulation, nuclear decommissioning, environmental corrective actions and emergency preparedness. Based upon their work, the COGCC determined that it would impose five additional special conditions on APDs for locations more than one-half mile and less than three miles from the blast site; among other things, these conditions require operators to implement a comprehensive monitoring, sampling, analysis and emergency response plan (“SAP”), to limit the number of drilling rigs operating at one time in any one area, and to use closed loop systems to ensure containment of all materials that have been in contact with downhole strata and fluids. With these nine special conditions, the COGCC determined that oil and gas development with the three mile zone and more than one-half mile from the blast site will protect the environment and public health, safety and welfare.

Since January 2008, the COGCC has approved a total of 95 APDs for locations within the three mile zone and more than one-half mile from the blast site. Of these approved APDs, 45 are located two to three miles away, 39 are located one to two miles away, and 11 are located .75 to

one mile away. Thirty-three APDs are currently pending for locations the three mile zone, and all of these locations are at least two miles away.

Publicly Available Information

Much of the background information on Project Rulison is publicly available on the COGCC website at <http://www.cogcc.state.co.us>. This information includes:

- The COGCC's 1998 literature review and study.
<http://cogcc.state.co.us/Library/PiceanceBasin/Project%20Rulison.pdf>
- A peer-reviewed 1973 analysis of radiation doses from hypothetical exposure to Rulison gas.
http://cogcc.state.co.us/Library/PiceanceBasin/Rulison/American_Nuclear_Article.pdf
- The COGCC's 2004 order requiring that APDs for locations within one-half mile of Project Rulison be subject to a full hearing. <http://cogcc.state.co.us/orders2/1v/270.html>
- The presentations give by the COGCC, CDPHE and DOE at the October 2007 public information session.
<http://cogcc.state.co.us/Library/PiceanceBasin/Information%20Session%20October%2007%20Hearing/Informational%20Session%20October%202007%20Hearing.html>
- The 2008 sampling and analysis plan, including comments on the plan and responses to the comments. <http://cogcc.state.co.us/Library/PiceanceBasinReports.html> and <http://cogcc.state.co.us/Library/PiceanceBasinReports.html> under "Sampling and Analysis Plan for Wells Within 3 Miles of Rulison Test Site: Comments and Responses."
- Various gas and water monitoring reports from 2004, 2005 and 2006.
<http://cogcc.state.co.us/Library/PiceanceBasinReports.html> under "Project Rulison Area: PRESCO, Inc. Gas Well Drilling Monitoring Reports"
- Quarterly operational and environmental monitoring reports for 2008, as well as a COGCC audit of operator compliance with the SAP during 2008.
<http://cogcc.state.co.us/Library/PiceanceBasinReports.html> under "Project Rulison Area: Project Rulison Operational and Environmental Monitoring" and <http://cogcc.state.co.us/Library/PiceanceBasin/Rulison/2008%20COGCC%20Audit%20of%20Activities%20Subject%20to%20the%20Rulison%20SAP.pdf>

Responses to Questions

Your letter asked us to describe what viable technologies currently exist, including the benefits and risks, which are capable of yielding the kind of empirical data Garfield County

Commissioners are requesting from within the one-half mile zone. We understand that the DOE has used a number of currently available, viable methodologies to yield empirically modeled data to study the tritium levels within the one-half mile buffer zone of the Rulison blast site. A 2007 DOE report includes modeling and test wells within the one-half mile zone. The report contains a transport model for Rulison site. Based on the report, the DOE believes contamination remains within the original location of the Lot 11 blast site. The tritiated water vapor transport model contained in the report demonstrated tritium may migrate 220 feet towards the edge of the fracture region, concluding that it is unlikely tritium traveled any further. The report is available at <http://www.lm.doe.gov/land/sites/co/rulison.htm>.

The DOE has also issued a draft report entitled “Project Rulison Path Forward,” which describes additional modeling and recommends that gas developers adopt a conservative, staged drilling approach allowing gas reserves within the half-mile zone to be recovered in a manner that minimizes the likelihood of encountering contamination. The report is available for public comment on the DOE website at http://www.lm.doe.gov/documents/sites/co/rulison/RUL_PathForward_DraftFinal.pdf.

You also asked what steps will be taken if tritium or other radioactive materials are discovered during oil and gas development within the three mile zone. The SAP is designed to monitor the levels of radionuclides. If radionuclides are discovered in excess of the established screening level, increased monitoring frequency is initiated by the driller and the results are promptly reported to the COGCC. In the event of a radiological release during drilling or production, the SAP includes a radiological incident management plan, which sets forth specific actions to be taken for incident mitigation, response, and recovery procedures. Companies operating in the area must designate a professional radiation safety officer, subject to approval by the COGCC, whose responsibilities include radiation safety training, the monitoring and control of radiological operations, radiological measurements, interpretation of laboratory data results and emergency notifications to the COGCC and other authorities as described in the SAP. These policies are designed to balance the interests of the mineral owners referenced in the Garfield County letter with the ongoing protection of the environment and public health, safety and welfare.

Finally, you asked what evidence gives us confidence that there is little to no risk to the environment or to public health and safety as energy development continues “closer to or even into the one-half mile zone.” It is important to note that drilling is not moving closer to or encroaching on the one-half mile zone. As explained above, all APDs approved since January 2008 are for locations at least .75 miles from the blast site, and approximately ninety percent of the approvals are for locations at least one mile away. Moreover, all pending APDs are for locations at least two miles from the blast site, and the principal mineral lessee within the half mile zone, Nobel Energy, has publicly stated that it will not submit any APDs for locations within the half mile zone this year.

With regard to oil and gas development more than one-half mile from the blast site, the COGCC's determination that the nine special conditions will protect the environment and public health and safety is based upon the previously-described work by the COGCC staff and consultants and the CDPHE. Some of the reasoning behind this determination is summarized in a January 28 2008 letter from me to Luke Danielson, an attorney for the owners of certain real property near Project Rulison, and a January 17, 2008 email from me to Judy Jordon, the Garfield County Oil and Gas Liaison, both of which are attached for your convenience. The reasons include:

- A determination by the COGCC consultants that the public health risk posed by drilling more than one-half mile from the blast site is extremely low, that any resulting radiation exposure would be much less than the background radiation dose that all Colorado residents receive annually from cosmic rays and other naturally occurring sources, and that the sampling requirements would provide an ample warning before a radiation level is reached that could pose a public health risk.
- A peer reviewed paper that assessed the radiation exposure that could have hypothetically resulted from use of the gas that was produced during the early 1970s from the test well located at the blast site and concluded that even under a worst case scenario the resulting exposure would be only about 0.2% of the annual background radiation level.
- A determination by the CDPHE that gas development more than one-half mile from the blast site would not result in fracturing that intersects fracturing from the blast or otherwise releases radioactive materials because fractures from the nuclear blast and from a new gas well would each extend no more than 1,000 feet.
- Several studies and data from similar geologic formations indicating that the fractures from the blast and from a new gas well would each actually extend no more than 400 feet, making it even more unlikely that gas development more than one-half mile from the blast site would result in fracturing that intersects fracturing from the blast.
- Engineering and geologic information indicating that there is very limited potential for natural gas to move through the Williams Fork Formation, where the Project Rulison detonation occurred, making likely that any radioactive gas remains within the half-mile zone.
- The fact that numerous gas, air and water samples have been collected by a variety of parties in the Rulison area during the last 40 years and that radiation attributable to the blast site has not been detected above background. As a part of this effort, samples have been taken from more than twenty producing gas wells, which are located as close as seven-tenths of a mile from the blast site.

- The SAP requires the monitoring of all existing and new oil and gas wells within the three mile zone, which will ensure that prompt corrective action is taken in the unlikely event of a radiological release.

If and when an APD within the half mile zone is filed, the COGCC will consult with CDPHE and hold a formal public hearing at which the applicant will be required to demonstrate that the project will protect public health, safety and welfare, and the environment. At this hearing, Garfield County and DOE can provide their input and other interested parties will be able to raise any concerns they have. The COGCC, in turn, will be able to consider the site specific facts and circumstances and impose any appropriate restrictions and requirements. Through this process, the COGCC can and will ensure that any development that occurs within the half-mile zone will protect the environment and public health and safety.

The COGCC will holding another public information session on Project Rulison in Glenwood Springs on July 15, 2008. Like the October 2007 meeting, this session will include presentations by the COGCC staff, CDPHE, and DOE, as well as extensive opportunity for input from Garfield County, nearby property owners, oil and gas operators, and interested members of the public. This meeting is scheduled to begin at 9:00 am at the Hotel Colorado, 526 Pine St. Glenwood Springs, CO 81601.

I hope this information is helpful and responsive to your letter. Please contact me with any further questions or comments.

Sincerely,

David Neslin
Director
Colorado Oil and Gas Conservation Commission
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cc with attachments: The Honorable Steven Chu – Secretary, U.S. Department of Energy
John Martin – Chair, Garfield County Board of County Commissioners