

## BACKGROUND INFORMATION

The Cerro Grande Fire burned about 45,000 acres in northern New Mexico in May 2000. The fire burned for 16 days over the Pajarito Plateau, including approximately 7500 acres of the Los Alamos National Laboratory (LANL) site. At the request of the New Mexico Environment Department (NMED), the Department of Energy provided funds for an independent study of public health risks from the fire. *Risk Assessment Corporation (RAC)* performed the study under contract to NMED. RAC estimated the potential risk to the public from chemicals and radioactive materials released from the Cerro Grande Fire burning over LANL property and from the fire itself. A team of national and international scientists led by Colorado State University provided technical peer review of the work. The NMED provided opportunities for public input throughout the 18-month study period. In addition, RAC held three public meetings during the project to answer questions and to talk about the study findings.

## SUMMARY OF RISKS

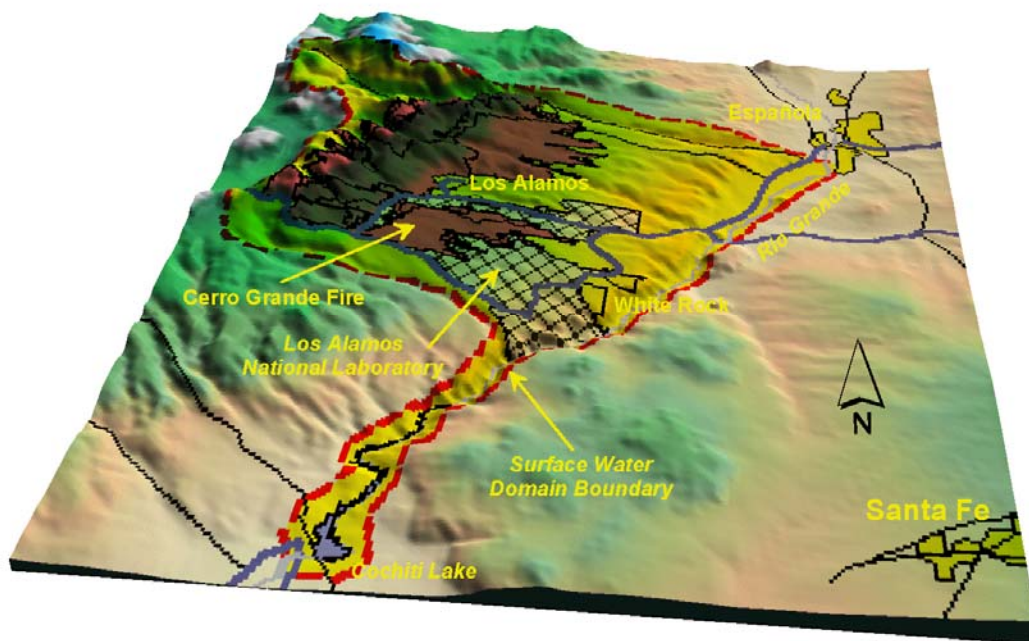
### What did we find about risks to the public?

We estimated the potential annual cancer risk to be less than 3 in 1 million from exposure to any LANL-derived chemical or radioactive material that may have been carried in the surface water and sediments to the Rio Grande and Cochiti Lake. If exposure to the same concentrations of LANL-derived chemicals or radioactive materials was assumed to continue for 7 years (the time it may take to return to pre-fire vegetation conditions in the area), then the potential cancer risk was greater at about 20 in 1 million. Potential exposures to LANL-derived chemicals that are not carcinogenic were within acceptable intakes established by the U.S. Environmental Protection Agency (EPA). We evaluated the potential health risks for hypothetical people drinking water from the Rio Grande or Cochiti Lake, contacting sediments near the edge of the water, eating fish from the Rio Grande or Cochiti Lake, eating produce irrigated with water from the lake, eating beef raised in the area, or participating in recreational activities like swimming. The type of exposure contributing most to the potential risk was eating fish.

### Were there other important results from this study?

The study provides a basis for identifying specific areas at LANL, certain chemicals and radioactive materials, and the most important types of exposure that could contribute to potential risk. More focused attention can be given to refining or increasing available information about those areas, materials, and types of exposure in the future.

## STUDY AREA



The study area encompassed approximately 182,000 acres (738 km<sup>2</sup>). In relation to the LANL facility, the study area extended to the west to include the upper Pajarito Plateau watersheds for the canyons, to the north to include the extent of the burned area in Santa Clara Canyon, to the east to include the Rio Grande, and to the south along the Rio Grande and downstream of Cochiti Dam.

## RELEASES TO SURFACE WATER

## POTENTIAL RELEASES TO SURFACE WATER

### ➤ What are the sources of chemicals and radioactive materials that could have been released to surface water following the fire?

Chemicals and radioactive materials in the surface water study area came from past and ongoing operations at LANL, were deposited as fallout from global atmospheric weapons tests, or were present naturally in the environment. We evaluated more than 250 chemicals and 75 radioactive materials during the study.

### ➤ Why is the fire important to the release of chemicals and radioactive materials to surface water?

The fire destroyed vegetation and changed the surface soil, which has increased the amount of storm water that could flow through the canyons. This increased storm water flow has the potential to carry with it greater amounts of soil, sediment, and ash from the entire impacted watershed, including some areas at LANL that contain elevated levels of chemicals and radioactive materials. New vegetation cover is stabilizing the soils, but this takes time, especially on the steeper hillsides.

## STUDY METHODS & LIMITATIONS

### ➤ For whom were risks calculated in the study area?

We developed four scenarios to evaluate potential risks to people in the study area from exposure to chemicals and radioactive materials in surface water or sediments. These scenarios were (1) a local hunter, (2) an adult and child residing near the Rio Grande below Cochiti Lake, (3) a resident on the Rio Grande at the confluence of Water Canyon, and (4) a local fire/cleanup worker on the LANL site during and after the fire. The hypothetical individuals in Scenarios 2 and 3 were exposed by drinking water from the Rio Grande or Cochiti Lake, contacting sediments near the edge of the water, eating fish from the Rio Grande or Cochiti Lake, eating produce irrigated with water from the lake, eating beef raised in the area, and participating in recreational activities like swimming. The hypothetical individuals in Scenario 1 were exposed through drinking water from the river, contacting sediments, and eating fish from the river. The hypothetical individuals in Scenario 4 were exposed by contacting sediments near the edge of streams. We evaluated potential risks using predicted concentrations of chemical and radioactive materials at points of exposure selected for each scenario, considering their likely activities and methods of exposure.

### ➤ How were environmental measurements used in the study? Why can't these measurements be used directly to determine the risks?

Extensive surface water and sediment monitoring data were collected by different agencies during and after the Cerro Grande Fire. Unfortunately, not all of these measurements can be used directly to evaluate potential future risks. In addition, monitoring for some chemicals and radioactive materials was not done, and concentrations for others were frequently at levels below the detection limits of the laboratory instruments. As a result, we used environmental transport computer models to predict concentrations in water and sediment at different locations.

### ➤ How certain are these risk estimates?

There is some uncertainty in the estimated concentrations and associated risks because of questions about the accuracy and completeness of data and limitations associated with predicting the behavior of materials in the environment. In particular, much of the available data was collected for other purposes and so was not ideally suited for this study. Because of this, we made a number of assumptions that significantly reduced the possibility of underestimating potential risks. When we compared some of the environmental measurements with our predicted concentrations, we found the computer model predicted concentrations higher than current environmental measurements, which indicates that our cautious assumptions likely resulted in overestimated concentrations and health risks from the fire.

## MORE INFORMATION

### ➤ Where can I get more information about this project?

Contact the NMED DOE Oversight Bureau  
2905 Rodeo Park Drive East, Bldg. 1  
Santa Fe, NM 87505  
Telephone: (505) 827-1536  
[www.nmenv.state.nm.us/DOE\\_Oversight/RAC.htm](http://www.nmenv.state.nm.us/DOE_Oversight/RAC.htm)

Information about the Cerro Grande Fire can also be found at several other websites:

- [www.nmenv.state.nm.us/IFRAT](http://www.nmenv.state.nm.us/IFRAT)
- [www.lanl.gov/worldview/news/fire/](http://www.lanl.gov/worldview/news/fire/)
- [www.nps.gov/land/fire.htm](http://www.nps.gov/land/fire.htm)



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