BACKGROUND INFORMATION

After the Cerro Grande Fire burned through Los Alamos National Laboratory (LANL) property in May 2000, the New Mexico Environment Department (NMED) requested an independent study of public health risks from the fire by the Risk Assessment Corporation (RAC). RAC developed a method for identifying the quantity of a chemical or radionuclide released to air, water or soil over a certain period of time by inputting a set of data characterizing LANL's potential release sites (PRSs) into computer models. The models, jointly called CALPUFF, were used to estimate the movement of combustion products common to all wildfires. RAC began by estimating the amount of vegetation burnt in the fire. Then they estimated the amount of respirable particulate matter (ash) less than 10 micrometers in diameter (PM10) that would have been produced from such a burn. Information collected on the air transport of PM10 from fires studied and documented previously was used in the computer models to estimate the movement, shape and location of smoke from the Cerro Grande Fire. Using these smoke plume and fire models, RAC then predicted contaminant concentrations and their locations according to the contaminant inventory reported in PRS soil characterization data.

"There are uncertainties associated with the accuracy, completeness and representativeness of the actual characterization data" **(RAC 3-15)**

WHY ARE WE RELYING ON FLAWED DATA?

There were uncertainties associated with the accuracy of potential release site (PRS) soil samples because:

- Data characterizing potential release site (PRS) soil was provided to RAC by the Environmental Restoration (ER) Project of LANL and collected by the Environmental, Safety and Health Division of LANL (ESH-17) between 1993 and 1997. More recent studies have demonstrated that previous estimates of soil contamination were underestimated. According to Bernd Franke, of the Institute for Energy and Environmental Research in Heidelberg, Germany, the current release estimates for plutonium isotopes of 3.4 curies are more than twice those previously estimated.
- PRS soil characterization data was not collected for the purpose of risk detection.
- The manner in which the ER Project collected data was not consistent for the different PRSs.
- Due to inconsistencies in the compilation of the PRS fields within the database, there were uncertainties associated with PRS boundaries and sample locations.
- There were uncertainties associated with the validity of certain analytical data (i.e., because there are no results for plutonium 241, the accuracy of the results for americum 241 and possibly neptunium 237 can be called into question).
- RAC was apparently pushed for time. Under the section entitled, *Limitations and Uncertainties Associated with Estimated Source Area Concentrations*, RAC explains, "The short time frame and limited resources available to us for this project required us to make several assumptions about the [PRS soil characterization] data." (RAC 3-14)
- The PRS soil characterization data was insufficient because LANL sampled for specific contaminants and did not conduct an unbiased sampling of all contaminants present.

WHY ARE WE RELYING ON FLAWED METHODS?

The CALPUFF model is actually a modeling system consisting of a meteorological model (CALMET), a dispersion and deposition model (CALPUFF) and a post processing program (CALPOST). Together, the models calculate hourly, three-dimensional wind fields and temperature on a three-dimensional gridded modeling domain in order to simulate the dispersion and transformation of material emitted from a fire. There are uncertainties associated with the accuracy of methods because:

- RAC limited terrain detail to allow for a greater area to be included in the model domain. Major topographical features were identified, while smaller canyons were not well resolved.
- In a highly fluctuating meteorological environment and with the fire creating its own environment, wind fields were modeled using only 11 surface meteorological stations in the simulation. LANL stations at Technical Areas 6 and 41, as well as San Ildefonso Pueblo and Los Alamos, were not used in the simulation. According to Bernd Franke, the inclusion of these stations would have resulted in major changes in the overall results.
- Six meteorological stations used in the simulation were NEWNET stations. In July 2000 Bernd Franke discovered that wind directions in NEWNET output files were incorrectly reported because of an incorrect algorithm in converting vector data to wind speed and wind directions.
- It is unclear from the RAC report how many days or for how long a period wind fields were modeled. They appear to have been modeled for only one day - May 11, 2000 at 10:00 a.m.
- The estimated release modeling from the PRS data was limited to three days from May 11 to May 13, the three days the fire was most active in a flame combustion stage. Yet nearly 70% of the total particulate emissions from wild fires occur during the smoldering stage that lasted for many days, and in some cases weeks, after the fire passed through LANL property.

WHY ALL THE APPREHENSION?

- During the fire, Lee McAtee, the deputy division director for environmental safety at LANL said, "It's not necessary to determine whether radiation has been released, but the lab is rushing the tests anyway because the public is screaming about it." Meanwhile other LANL representatives claim LANL took "proactive and unprecedented actions [...]to minimize the movement of contamination off Laboratory property."
- Through the Emergency Rehabilitation Team (ERT), LANL developed an "extensive environmental monitoring and sampling program to evaluate the effects of the Cerro Grande Fire at the Laboratory and especially to evaluate if the Laboratory may have impacted public and worker health and the environment as a result of the fire." Results from program studies were allegedly made available to the public at given Internet locations. After an estimated fifty hours spent at the task of seeking out these data, there were still no intelligible results to be found, even two years after the fire.
- When results were released from AIRNET, a network of air monitors operated by LANL, the news media (i.e., *The New Mexican* and *Albuquerque Tribune*) reported that data did indicate an increase of radioactive elements (gross alpha, beta and gamma) in the smoke. In its report, LANL explained this increase as the naturally occurring radionuclides that exist in all living organisms and are released during all forest fires. However, a NMED spokesman pointed out that this claim was based on "a working hypothesis," and not the necessary scientific facts.
- Nearly a year after the fire the New Mexico Attorney General's Office still had not received all of the results from soil and water sampling. In May 2001 the office filed a Freedom of Information Act request with the Department of Energy. The federal agency failed to respond to the request even six months after it had been issued and the Attorney General's office began threatening to seek a court order. When the office finally did receive the information, it was nearly impossible to interpret.

WHAT CAN YOU DO?

1. Support community members who are taking alpha and beta radiation samples every two weeks and quarterly gamma measurements in order to establish background measurements for the Embudo Valley.
2. In order to establish background measurements for contaminants, ask LANL for quarterly surface water, sediment, soil and vegetation sampling, along with independent sampling by the community to confirm LANL's results.
3. Work to enhance the emergency response capabilities in Rio Arriba and Taos Counties in order to respond to the next LANL emergency, including the need for equipment for the KLDK local radio station.

FOR MORE INFORMATION CONTACT: Sheri Kotowski at (505) 579-4076 or Concerned Citizens for Nuclear Safety (CCNS) at (505) 986-1973 or www.nuclearactive.org.