

# **Committee on Resources**

## **Subcommittee on Forests & Forest Health and**

## **Subcommittee on National Parks and Public Lands**

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### **Witness Statement**

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#### **Testimony**

#### **To the National Parks and Public Lands Subcommittee**

#### **and the Forest and Forest Health Subcommittee**

#### **of the Resources Committee**

#### **United States House of Representatives**

**By Dr. Richard J. Burick**

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**Los Alamos National Laboratory**

**June 7, 2000**

#### **Topic: Fire Management on Public Lands**

#### **Introduction**

Thank you for providing this opportunity to report on the management and impact of the Cerro Grande fire on Los Alamos National Laboratory. I am Dick Burick, Laboratory Director for Operations and Emergency Director for the two weeks the Laboratory was in a state of emergency (May 7-22).

The Cerro Grande fire was the largest wildfire in New Mexico State history, burning almost 43,000 acres and causing upwards of \$1B in damages. The fire was a crisis for the Laboratory and a disaster for 400 town families, among them many Lab workers who lost their homes. Many neighboring communities were also heavily impacted by the two-week emergency, and the whole state of New Mexico was significantly involved. The possible environmental effects including flooding from the denuded mountainsides above the county and the neighboring pueblos are yet to be felt. Additionally, fire is still a potential danger due to dry lightning strikes as our summer monsoon season approaches. Although Lab site fire prevention and management measures were outstanding in reducing the impact of the fire on our major facilities, the damage in the national forest watershed leaves a potential environmental disaster that must be mitigated soon, although return of the mountainside to a natural state will take many years.

Nonetheless, I can assure you that the Laboratory is getting back to work.

My key messages are therefore:

- § Fire planning and protection within the Laboratory minimized damage to permanent facilities.
- § Environmental sampling shows no evidence to date of significant fire-related releases of hazardous or radioactive materials from Lab operations.
- § The Laboratory is getting back to work, but recovery will take time and cost in the range of hundreds of millions of dollars.
- § We must help the impacted communities and businesses recover, for their own sake as well as the recovery of full productivity and vitality of the Laboratory.
- § There are critically important lessons to be learned from this incident.
- § We are deeply grateful for the support received from so many quarters.

## **Fire Risk Management**

### ***Site description***

Los Alamos National Laboratory occupies a 43 square mile tract of Department of Energy land about 30 miles northwest of Santa Fe, New Mexico. On the south (approximate direction), the Lab borders Bandelier National Monument for about 6 miles. Santa Fe National Forest rises above the Lab on the west for about 4 miles. Los Alamos County townsite business and residential areas are on the north for several miles. The eastern boundary, sloping down toward the Rio Grande, is shared with San Ildefonso Pueblo, the White Rock community within the county, and DOE lands down to the river.

Much of the site is covered with native vegetation. Laboratory operational areas are distributed throughout the site. Because much of the Lab's area has a natural environment, there are shared safety and ecological concerns including wildfire management with national parks and forests. Unlike these lands, the Lab also houses high value assets that are critical to national security. The Lab's wildfire management practices must suit its particular situation.

### ***Recent fires***

Two previous wildfires near the Lab's southern boundary raised our fire risk awareness. In 1977, La Mesa fire burned extensively south of State Route 4 along the Bandelier-Laboratory boundary and made some incursions across the road into Laboratory lands. This burn cleared a firebreak that reduced the future fire threat along several miles of the road. This firebreak has been maintained in recent years through the use of prescribed burns. In 1996, the Dome Fire burned south and east of the old La Mesa burn on National Park and Forest Service lands and could have threatened the Lab's southeast corner.

### ***Fire management planning***

The possibility of a fire of this type was studied as part of the work on the Lab's 1999 Environmental Impact

Statement. The risk was taken seriously and was factored into our emergency preparations, planning, and exercises. An Interagency Wildfire Management Team was formed with representatives from the Lab, DOE, County, the State of New Mexico, the Forest Service, the Park Service, the Pueblo of San Ildefonso, and other interested parties to coordinate wildfire mitigation measures in the area. The Team helped the Lab plan and implement an extensive tree thinning program on the western boundary of the Lab along State Road 501 and around key Laboratory facilities.

Management preparations included development of emergency plans, readiness of the Laboratory's Emergency Operations Center (EOC), and coordination with the county and state.

Physical protection of the Lab's critical assets has been a major consideration for the Lab's entire history. Most of the Lab's permanent structures have fire-resistant metal or concrete construction. Sensitive materials--chemical explosives as well as nuclear materials--are stored in vaults, bunkers, and other storage secure against the worst infernos.

During the fire, it became imperative to allow firefighters without security clearances into many Lab areas that form external buffer zones around secure buildings. We were able to do this because classified materials and information still had two or more layers of protection--kept within locked rooms (and usually also locked vaults or safes) in locked buildings. The guard force, 400 strong, was intensively employed during the fire to ensure security as well as safety. Re-establishment of security after the fire followed standard procedures.

The Lab has sites well suited for emergency incident command posts. One such site was made available and occupied by the Forest Service Incident Command Team at our Technical Area TA-49. At the fire's peak, over 1200 firefighters slept and ate at this site.

### ***Effectiveness of preparations***

Laboratory and Forest Service firefighting resources were deployed as the wildfire spread above the Lab's western border. Firefighting and the new fuelbreak on the Lab's western border, where the trees were thinned for 200 yards or so on both sides of the road, held the fire off of Lab property for three days while the fire raged just west of the Lab. Fire breakout in the Lab occurred from a third wave of fire jumping the highway and spotting a fire in Water Canyon. Because of the fuel break, several miles of thinned boundary forest remain green.

The fire in the Lab spread rapidly from Water Canyon north and east across the Lab lands. There were then two battles then being fought--one in the Lab and one in the town--dividing the resources available for either front, especially during the most critical days of May 10 through 12 (a timeline is included in the attachments). However, by Tuesday May 10 the Forest Service Type I Incident Command Center based on Laboratory site TA-49 was mounting and deploying a large force.

During the fire, emergency firebreaks were cleared around key facilities. These allowed firefighters better access into the burning areas and protected important buildings from major damage. An emergency firebreak was also made near the Lab's eastern boundary to protect the community of White Rock. The new firebreaks were not breached by the fire, proving their effectiveness. We will continue to maintain our firefighting access roads, fire breaks, and fuel breaks, as part of our wildfire defense.

Operation of the emergency coordination centers was effective. DOE's Los Alamos Area Office presence in

the Laboratory's EOC was important to the decision-making process. Adequacy of the EOC communications network and other facilities at times was strained. As the fire spread and became more serious over several days, space in the EOC was at a premium. The telephone network--landline and cellular--was overloaded. The demand for computer network connections exceeded the supply. Radio links were critical to maintaining command and control. It became clear that a more modern facility with improved communications is needed. In planning a new facility, co-location with the county should be considered.

## **Fire Impact and Lessons Learned**

The fire burned about 8000 acres of Laboratory land with variable intensity. Although the burned areas contain most of the Laboratory's key facilities, no major structures were significantly damaged, owing to fire resistant construction, site clearing, and intense firefighting efforts.

The Lab's most sensitive materials, information, and equipment were secured and protected from a wildfire. Because of this planning and protection, the Lab's facilities are largely intact and we are now re-engaging with programmatic work. This is an important lesson to be learned.

Losses among temporary and vulnerable structures and facilities were higher. In recent decades, the Laboratory has made use of transportable buildings and trailers for "temporary" workspace. These buildings are less fireproof and one containing twenty desktop computers was burned, losing many years of personal scientific effort. Thirty-nine such structures were destroyed. Lesson learned: sometimes cheap can cost twice. Many satellite storage facilities were damaged and will need rapid replacement.

Vulnerable systems including power and communications networks were extensively damaged in the outlying sites. Repairs are expensive and time consuming. In the aftermath we see that failure of the entire electrical system in the county was a significant possibility. Availability of electrical power was essential to keeping water available for firefighting. At one point, while fire fighters were battling the fire in the townsite, electrical power failure to a water-well pump resulted in loss of water; structures that might have been saved were lost. The lesson is that the infrastructure needs to be made more robust.

The fourth lesson is "never forget." After La Mesa fire in 1977, the Laboratory took a few wildfire mitigation measures but did not maintain these over time. It was not until the Dome fire in 1996 that we began to take long-term preventative measures, such as tree thinning and improving our firefighting access and firefighter training and equipment. We have learned from the Cerro Grande fire that these measures were effective and should be continued and expanded.

## **Repairs, replacements, remediation, upgrades**

Some of the fire damage is pervasive. There is hardly a workspace in the Lab that was not affected by soot and smoke. The extent of computer damage from fire and smoke is yet to be totaled--perhaps hundreds of desktop machines will need replacement.

Because of the fire, some Laboratory vehicles, communications equipment, and building furnishings were lost and need replacement. Overtime effort by critical Lab services including security forces as well as the fire department was an unbudgeted cost.

These kinds of costs are counted in Resumption of Programmatic Operations, currently estimated at \$15M in FY00.

The Los Alamos Fire Department--a joint DOE-county resource--needs repairs, replacements, and upgrades if it is to be ready to handle another major event. Equipment damage, losses, and shortfalls would present a severe drawback if we were challenged soon by another fire. This is a very real possibility, since forest fuel loading is still 80% of pre-fire condition, and 70% of the Lab's area is still unburned. In addition, site fire alarms need repair, replacement, or upgrades, and site fire risk mitigation should be extended. These extra fire protection costs are estimated at \$24M for this year.

Erosion control, expansion of soil, air, and water monitoring equipment, and risk reduction through permanent disposal of Lab radioactive wastes are estimated to cost \$37M this year. The environmental issue is discussed in a section below. The radioactive waste disposal issue is raised by the vulnerability of the Lab's aboveground waste staging facility at TA-54. These temporary buildings cover thousands of cubic yards of waste contaminated with special nuclear materials, waiting in steel barrels for shipment to the Waste Isolation Pilot Plant in Carlsbad, New Mexico. The storage site was untouched by the Cerro Grande fire but is conceivably vulnerable to a local conflagration. Aboveground storage of these wastes was never considered as an acceptable permanent solution, and the urgency of moving this material to a permanent repository is now underlined.

Repair of the Laboratory infrastructure including building cleanup and power and communications repairs is estimated at \$52M this year.

The DOE Albuquerque Operations Office incurred \$2M in extra costs for emergency support and assistance. Some other DOE costs are included in the estimates above.

These estimates total approximately \$130M for the current fiscal year. Only items on which very rapid action is required will be undertaken before October. Costs for FY01 are provisionally estimated at about \$100M, with comparable or smaller amounts in the out years. Thus the costs to the Laboratory and DOE attributable to the fire and its aftermath could exceed \$300M. Much of this work is essential and supplemental funding is urgently needed this year. If specific funding is not provided, our sponsors may end up with an extra burden that will detract from the programmatic work they expect. These costs do not include the value of the lost productivity for several weeks, roughly \$50M for 3 weeks.

## **Environmental Protection**

Possible mountainside runoff floods raise concerns over impacts to the Lab, the town, and downstream areas--and the concerns are elevated because of residues from Lab operations.

There are over 600 potential contamination release sites on the Laboratory's 43-square mile site, ranging in size from square yards to several acres to the entire length of some canyons. Contaminants vary widely in types and amounts from one site to another and include radioactive and non-radioactive materials deposited during the 1940s and 1950s that are now typically 12-18 inches below the surface. Storm runoff could have various effects.

The Cerro Grande wildfire destroyed or damaged large areas of vegetation on the mesas and in the headwaters of streams of the southeastern slopes of the Jemez Mountains. Similar destruction took place along the canyons that traverse the Laboratory and the Los Alamos townsite. The most serious damage from the firestorm occurred in the upper watersheds. The potential risk of significant flooding from these conditions is high. Fire damage combined with heavy rains which typically occur in New Mexico in the summer could result, unless extensive mitigation is in place, in runoff scouring and flushing of canyon

bottoms; diluting legacy contaminants from Lab operations in the soil, ash, and water runoff; and transporting, dispersing, or burying the contaminants in the flushed material. In fact, Los Alamos experienced a major storm last Friday (June 2) where 0.5 inches of rain fell in 1 hour. One road was covered with a few inches of ash-mud flow.

Canyon floods could impact the Laboratory, the townsite, and three pueblos holding lands traversed by the canyons downstream of the Lab. As floodwaters, the canyon streams could reach the Rio Grande and sediment could be deposited in Cochiti Lake, southeast of Bandelier. There is no diversion of surface waters from these canyons.

There are several Lab facilities located in the potentially impacted canyon bottoms. Safety as well as environmental concerns are considerations in these locations.

The Laboratory with other experts, including the interagency Burned Area Emergency Rehabilitation (BAER) Team, is assessing this situation and developing a range of options to manage the risks. The initial steps taken by BAER for erosion control in such situations are underway on the Forest Service lands throughout the damaged watershed. This is BAER's largest exercise to date. The Laboratory has designated an Emergency Rehabilitation Team to address the issue on its lands. Since the floodwaters could cross public and DOE lands, there is close coordination between BAER and the Lab.

We believe that there is no health risk due to contaminants from Lab operations in the runoff, and that material concentrations will remain below regulatory levels. The remediation plan includes extensive additional surface and well water monitoring. Nonetheless, in view of the Laboratory's goal of zero environmental impact, the measures necessary to reduce or eliminate contaminated runoff under various scenarios will be evaluated and appropriate action taken. Unfortunately, the most extreme measures involve collateral environmental damage as well as costs in the range of tens of millions. A decision on the steps to be taken will involve stakeholder input, but action must be taken before the period of expected heavy summer rains if we are to have the best chance of preventing serious problems.

### **Status of programmatic work**

By Friday May 26 almost the entire Laboratory and contractor workforce was able to reoccupy the Laboratory for facility recovery and to restart programmatic work as approved. However, not all needed workspace is yet available. Some worksites in the southwest corner of the Laboratory had significant smoke damage or do not have power or communications. Return to programmatic work is variable around the Laboratory, ranging from near 10% in the most impacted sites to near 100% in the least impacted. Laboratory-wide, the fraction of normal program effort now resumed is in the range of 70-80%. Full recovery may be delayed as some worksites now reoccupied are closed while the flood risk is significant.

### **Workers and community**

Economic losses to the local area were minimized by payroll continuity for the Laboratory and its integrated contractors. Some businesses also paid their employees for the involuntary lost time. However, on-site construction contractors and their workers were not paid for lost worktime, and many businesses in the county lost several weeks' worth of activity.

The Laboratory has announced a policy of accommodating personal leave time necessary as a consequence of the fire, for example to deal with insurance and housing problems, without penalty to the employee.

Some county businesses have adopted the same policy.

Many sources of aid are available to impacted individuals and businesses. The University of California provided immediate grant aid to persons in need. The Laboratory, the county, and several financial institutions have several programs to help local businesses bridge the period of lost income. FEMA has been a mainstay for organizing and delivering community support.

However, between two and three dozen foreign national employees of the Laboratory, largely permanent resident aliens, are ineligible for federal aid. Their immediate needs are being met, but the future is not so clear for them. FEMA says this is a recurrent problem in other disasters. Congress may wish to consider remedies for persons caught in this no-man's land.

The strength, appearance, vitality, and security of the community as well as the recovery of the Laboratory are important to our recruiting efforts as well as to our personnel trying again to focus on their jobs.

### **Concluding remarks**

The Laboratory's national role means that Lab operations should be protected from natural disasters as much as possible. We cannot count on wildfire management measures on the surrounding public lands to protect us, and fires started within our own boundaries are inevitable. Because the wildfire hazard has not gone away, we expect to redouble these efforts. An institution such as this Laboratory must invest in site development, construction, infrastructure, and maintenance that takes into account the forces of nature. This does not often look like the least expensive route.

After prevention comes control of fires. We are extremely fortunate to have the high quality of personnel available in the Los Alamos Fire Department, and we are extremely grateful to all of the agencies that poured in their own people and equipment. After each fire season these resources need replenishment. This fire season, already the worst in the state's history, will leave many of these resources exhausted.

The nation should consider establishing an interagency wildfire research center that can bring together modern technology with established approaches to fire management. For example, the center could help apply computer modeling to estimate wild lands fire vulnerability, evaluate management strategies, and help guide firefighting efforts.

After the fires are extinguished comes recovery from the impacts. Full recovery in the Lab and town will take years. Assistance from the Lab and government to enhance community recovery is important to regaining Laboratory productivity and maintaining vitality.

A new hazard--floods possibly of unprecedented violence in this area--complicates the picture. This hazard will couple public, DOE, and tribal lands and interests in a complicated way, stressing the cooperation necessary to make and execute a plan necessary to handle a thirty- or hundred-year magnitude rainfall. The plan will not address all possibilities nor totally satisfy all parties, but as in the fire, teamwork will help solve many problems.

I cannot thank enough everyone who helped save the Lab and the town during the terrifying events of May 2000.

### **Attachments**

## Timeline

### *Cerro Grande Fire: Los Alamos Under Siege*

--a color folder from Los Alamos National Laboratory

## Timeline

May Thursday 4	Prescribed burn is set by Bandelier workers on Cerro Grande.
May Friday 5	Fire becomes a wildfire.
May Saturday 6	Back burns set
May Sunday 7	Driven by southerly winds over 30 mph, the fire crosses the headlands of Water, Valle, and Pajarito Canyons above the Laboratory to the west, and reaches Los Alamos Canyon, adjacent to the townsite. Laboratory announces emergency closure on Monday.
May Monday 8	Laboratory activates Emergency Operations Center, suspends all programmatic work.
May Tuesday 9	Forest Service Type I Incident Command Team mobilizes at TA49. UC visitors briefed.
May Wednesday 10	On two fronts, fire burns north and east through laboratory and residential areas; townsite evacuated. President designates disaster, FEMA activated. Governor Johnson arrives.
May Thursday 11	Fire burns east down Pajarito Canyon to TA-18. White Rock evacuated that evening. DOE RAP deployed. Sec. Richardson, FEMA Dir. Witt, Senators Domenici, Bingaman visit.
May Friday 12	Fire advancing through National Forest northward to county line. Offsite meetings of senior and extended management teams arranged. Policies regarding payments to employers and contractors formulated. N.M. Speaker of House Sanchez, Sec. Babbitt, U.S. Rep Udall visit.
May Saturday 13	EPA air monitoring teams active. Fire intense in Santa Clara Canyon. Meetings of laboratory managers expand. Lab announces continuity of payroll. Gen. Habiger visits.
May Sunday 14	Fire diminishes. White Rock reopens. US Sen. Stevens tours with ALOO chief Glass.
May Monday 15	Laboratory begins planning systematic process to reoccupy site. Administration Building opened to provide temporary workspace for lab leadership; Otowi Building opened to start Business Division operation. BAER team arrives. UC delegation visits.
May Tuesday 16	Laboratory establishes interim teams to manage recovery.
May Wednesday 17	Many facilities approved for occupancy.
May Thursday 18	Interior Secretary Babbitt news conference in Santa Fe.
May Friday	More facilities approved for occupancy. EOC reduces coverage.



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May Sunday      Tour provided for state officials

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May Monday      Limited reoccupancy of laboratory begins; lab ends state of emergency.

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May Wednesday Lab establishes Environmental Rehabilitation Project

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May Thursday    Majority of lab workers return to work

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May Monday      Memorial Day: Air and ground operations continue; Viveash fire starts north of Pecos.

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