

**MINUTES  
of the  
THIRD MEETING  
of the  
WATER AND NATURAL RESOURCES COMMITTEE**

**August 4-5, 2005  
Oppenheimer Study Center, Los Alamos National Laboratory  
Los Alamos**

The third meeting of the Water and Natural Resources Committee was called to order at 10:10 a.m. on Thursday, August 4, 2005, by Senator Carlos R. Cisneros, chair.

**PRESENT**

Sen. Carlos R. Cisneros, Chair (August 4)  
Rep. Joe M Stell, Vice Chair  
Sen. Sue Wilson Beffort  
Rep. Ray Begaye  
Rep. Joseph Cervantes  
Sen. Dede Feldman  
Sen. Mary Jane M. Garcia  
Rep. Larry A. Larrañaga (August 5)  
Rep. Kathy A. McCoy  
Sen. Steven P. Neville  
Rep. Andy Nunez  
Sen. Mary Kay Papen  
Sen. H. Diane Snyder  
Rep. Mimi Stewart  
Rep. Sandra L. Townsend

**Advisory Members**

Sen. Vernon D. Asbill  
Sen. Clinton D. Harden, Jr.  
Sen. Gay G. Kernan (August 4)  
Rep. James Roger Madalena  
Rep. Danice Picraux  
Sen. Nancy Rodriguez  
Sen. John C. Ryan  
Rep. Peter Wirth

**ABSENT**

Rep. Dona G. Irwin  
Sen. Cynthia Nava  
Rep. Don L. Tripp

Sen. Rod Adair  
Rep. Richard P. Cheney  
Rep. Anna Marie Crook  
Rep. Candy Spence Ezzell  
Sen. Timothy Z. Jennings  
Rep. Rhonda S. King  
Rep. Ben Lujan  
Rep. Greg Payne  
Sen. Leonard Lee Rawson  
Rep. Henry Kiki Saavedra  
Sen. Leonard Tsosie  
Rep. Eric A. Youngberg

(Attendance dates are noted for those members not present for the entire meeting.)

**Staff**

Gordon Meeks  
Evan Blackstone  
Jeret Fleetwood

**Guests**

Rep. Nick L. Salazar  
Rep. Jeannette O. Wallace (August 4)

The guest list is in the original meeting file.

**Thursday, August 4**

Representative Jeannette O. Wallace, Mike Wheeler, vice chair of the Los Alamos County Council, and Dr. Kathy Alexander, deputy associate director for strategic research, welcomed the committee to Los Alamos and provided it with a brief background of some of the water projects in which Los Alamos National Laboratory (LANL) is involved.

On a motion made, seconded and unanimously passed, the committee approved the minutes of the June 30, 2005 meeting as submitted.

**WATER SCIENCE AND TECHNOLOGY AT LANL**

Dr. Cathy Wilson, water portfolio manager at LANL, provided the committee with an overview of water projects with which LANL is currently involved. She explained that the laboratory has made significant investments in water-related research and that four directorates, 11 divisions and three program offices at the lab are involved in such research. Dr. Wilson also discussed the LANL Institutional Water Strategy Team, a group of individuals from different areas of LANL who have come together to develop and apply the best science and technology solutions to urgent local, regional, national and global water problems. She also provided the committee with examples of water problems that the strategy team has addressed.

Questions and comments included:

- Project "Zeronet";
- water desalination technology;
- contamination of water from Cerro Grande fire ashes;
- cost-effectiveness of brackish water cleanup;
- drought severity predictions; and
- uses for produced water.

**PREDICTION, DETECTION AND TREATMENT OF WATER SUPPLY THREATS**

Dr. Babetta Marrone of the Molecular Microbiology and Immunology Group at LANL provided the committee with testimony regarding potential threats to water supplies. She noted that while the connection between water health and hygiene is taken for granted in most of the United States, maintaining water quality in third world countries is literally a daily struggle. Dr. Marrone explained that water-ingested pathogens, such as those found in water polluted with

fecal matter, account for roughly 6,000 deaths per day, and that water treatment can eliminate most pathogens. However, she also noted that there are three basic kinds of pathogens: viruses, protozoa and bacteria, and that treatment methods that may be effective for one kind of pathogen may not be as effective for another kind.

Dr. Marrone went on to discuss research conducted by LANL regarding threats to water resources. She highlighted a project involving the laboratory and New Mexico State University (NMSU) to design and construct water filters. Dr. Marrone also discussed efforts to better understand the effect of climate change on pathogens and water disease surveillance efforts.

Finally, Dr. Marrone discussed Southeast Asia's avian virus, commonly known as bird flu. She explained that the virus is of particular concern to the World Health Organization because of its ability to travel directly from poultry to humans, which is rare in viruses. She also noted that concerns exist about the virus because of how difficult it would be to contain if it finds its way into the United States poultry population. Dr. Marrone indicated that the virus is of particular concern to New Mexico because of its location along the migratory routes of a large number of bird species.

Questions and comments included:

- cooperation with NMSU;
- high-risk areas for water contamination and vulnerability analyses;
- treatment of arsenic;
- the ability to detect bioterrorism that targets water sources;
- solutions to water vulnerability;
- pueblos impacted by LANL runoff;
- carriers of poultry virus;
- over-development;
- human physiological diseases resulting from avian flu;
- public policies that can prevent avian flu;
- the number of annual deaths from water pathogens; and
- prospects for a vaccine for avian flu.

### **WILDFIRE MODELING AND DEMONSTRATION**

Rod Linn, acting deputy group leader for the Atmospheric, Climate and Environmental Dynamics Group at LANL, provided the committee with a demonstration of the wildfire modeling program being developed at the laboratory. He explained that predicting wildfire behavior is a complex problem with many interrelated ties, such as the type of fuels, weather, topography and physics. Dr. Linn also noted that there are two basic types of wildfire modeling programs: an operational model and a much more detailed program. He explained that the more detailed program is most useful for examining how and why a past fire behaved the way it did or to help predict what kind of forest management techniques will yield the best resistance to large fires, rather than to try to predict how a fire that is already burning will behave because of the time it takes for the computer model to render a prediction. However, Dr. Linn noted that the operational model employed by the forest service is relatively effective for determining fire

behavior when time is a factor.

Finally, Dr. Linn showed the committee computer-generated models of several fires to show how complex variables can change the behavior of a fire.

### **RIO JEMEZ WATER AGREEMENT**

Marilyn O'Leary, director of the Utton Transboundary Resources Center at the University of New Mexico School of Law, John D'Antonio, state engineer, Paul Chinana, Pueblo of Jemez Council member, and Gilbert Sandoval, a non-Indian water user, provided the committee with an overview of the Rio Jemez water agreement. The group explained how Indian and non-Indian water users along the Jemez River came to an agreement over water use through the Utton Transboundary Resources Center instead of through litigation. Ms. O'Leary explained that one of the primary functions of the Utton Center is to help broker these kinds of agreements so that the parties involved do not have to take each other to court. Mr. Chinana and Mr. Sandoval provided the committee with a brief history of the agreement, noting that the Indian pueblos, including Jemez, Santa Ana and San Ildefonso, have the most senior water rights in the area. However, they explained that in addition to the large number of non-Indian users upstream of the pueblos, the community of Rio Rancho has a rapidly increasing need for water downstream from the pueblos. Mr. Chinana and Mr. Sandoval explained that the pueblos agreed to share their water with the upstream users, rather than forcing them to give up water in a court battle.

Mr. D'Antonio praised the agreement, noting that situations such as the one on the Jemez River, where senior users threatened to use court proceedings to curb the water use of junior users, are much more common during a drought. He also indicated that while the Office of the State Engineer (OSE) is working on drought management, the best solution is for stakeholders to come together to work out some sort of compromise before moving ahead with enforcement of priority rights. He reiterated his commitment to support negotiated water sharing agreements rather than to undertake prior administration in times of water shortages.

Questions and comments included:

- water rights purchases and transfers;
- detailed history of the Rio Jemez conditions and steps toward the negotiated agreement;
- sacred elements of the negotiations;
- control of development to protect water users in a system from which water rights have been transferred;
- how only consumptive rights of surface water rights may be transferred to a new domestic user;
- the impacts of domestic wells;
- use of the Rio Jemez settlement as a model for other settlements;
- specifics of the agreement's implementation;
- the effect on the river flow due to Rio Rancho's wells;
- the need for the state to identify water capacity;
- the Pueblo of Zia's purchase of agricultural land to prevent well drilling after water rights have been severed from that land and transferred to other uses;

- Rio Rancho's effect on the flow of the Rio Jemez;
- use of the legal system to pressure disputants to settle;
- state funding for components of the settlement;
- the ombudsman established at the Utton Center;
- needs of municipalities;
- how Rio Rancho has no San Juan-Chama water;
- the price of water rights;
- the amount of water being conserved;
- industry's role in water rights negotiations and settlements;
- the potential to increase net water use or depletions as a result of a water rights transfer;
- the corresponding mediation center in Texas to the Utton Center;
- new math in the Estancia Basin;
- active water management; and
- water transportation networks and the cost of financing water infrastructure.

### **AAMODT WATER RIGHTS SETTLEMENT**

D.L. Sanders, chief counsel for the OSE, provided the committee with an update on the *Aamodt* water rights settlement. He first provided the committee with a brief history of the *Aamodt* settlement, noting that it involves water rights settlements in the Pojoaque Basin. Mr. Sanders indicated that the terms of the settlement involve a regional water system featuring pipelines for water from other nearby areas. He noted that such water pipelines are indeed good water planning, but that they are quite expensive. Mr. Sanders went on to explain that the project would cost close to \$300 million, the bulk of which the federal government is supposed to fund. However, he also indicated that the federal government demonstrated a reluctance to fund the project in January and that nothing he has seen from the federal government since then gives him any reason to suspect that it will be any more willing to fund the project now. Mr. Sanders noted that several federal agencies now feel that they only need to fund large-scale water projects in the amount of the projects potential liability in court, which in the *Aamodt* case is significantly less than \$300 million.

Questions and comments included:

- New Mexico's share of the project cost;
- location of well fields for the project; and
- whether the project can possibly proceed without substantial federal funding.

The committee recessed at 5:30 p.m.

### **Friday, August 5**

#### **WATER AUGMENTATION THROUGH CLOUD SEEDING**

Sig Silber of the New Mexico Weather Modification Association provided the committee with an overview of the association's proposed cloud seeding project. First, Mr. Silber explained that "supercooled" moisture exists in most clouds, but that updrafts are often a little too strong for the moisture to fall as precipitation. He went on to explain that cloud seeding consists of

introducing a catalyst, often silver iodide, into the clouds to induce the supercooled moisture to fall to the ground as precipitation. Mr. Silber pointed out that the two main ways of introducing the catalyst into the clouds is either by ground-based burners using updrafts to carry the catalyst into the clouds or by aircraft dropping the catalyst into the clouds. He noted that both methods require a fair amount of precision, and that the proposed project would initially employ both methods to determine which provides the greater benefit. Mr. Silber then showed the committee the areas of the state the group plans to seed, noting that it plans to seed clouds during the winter to try to increase the snowpack in those areas. He also cited the success that cloud seeding projects have had in places such as Climax, Colorado, the Jemez Mountains, Tasmania and Israel. Finally, he assured the committee that employing cloud seeding technology only takes a very small amount of moisture out of the air, so it would likely not drastically change area weather patterns, and that while silver iodide is poisonous, such a small amount is used that traces of it cannot be found in the snow, water or soil of areas where cloud seeding projects have occurred.

Questions and comments included:

- success of previous cloud seeding projects in New Mexico;
- the use of ground-based generators in wintertime for snow augmentation;
- the Jemez Mountain Project from 1968 to 1972;
- scientific documentation of effectiveness;
- seeding in the Guadalupe and the Sacramento mountains;
- an explanation of the mechanics of cloud seeding;
- budget details;
- the use of propane for cloud seeding;
- costs of water rights compared to costs of cloud seeding;
- sources of funding of cloud seeding in Wyoming, Utah and Colorado (ski resorts) and California (hydroelectric power authorities);
- the state engineer's position;
- the absence of negative environmental impacts;
- the number of cloud seeding projects nationally (964);
- mother earth; and
- the anticipation of 15,000 additional acre-feet of water as a result of selective cloud seeding in New Mexico (enough to meet interstate compact delivery obligations).

### **WATER RESEARCH TECHNICAL ASSISTANCE OFFICE**

Charles Nylander, program manager for the Water Research Technical Assistance Office (WRTAO) at LANL, told the committee that the WRTAO was established to provide technical assistance, research and education to local entities regarding water issues. Mr. Nylander outlined some of the work in areas that the WRTAO has provided assistance, including supporting the Espanola Regional Planning Issues Forum, the Governor's Blue Ribbon Water Task Force and outreach to pueblos and tribes. He also showed the committee a segment of a video, which is a part of a larger series of videos, produced by the WRTAO. Finally, Mr. Nylander noted that the WRTAO has been offering testing services to local well owners to help them better understand the quality of their well water.

Questions and comments included:

- legacy waste effects on Mortendad Canyon;
- the New Mexico Department of Environment's consent order for LANL cleanup;
- field work by LANL on environmental monitoring; and
- technology for water quality analysis.

### **PREDICTIVE TOOLS FOR NEW MEXICO AQUIFER MANAGEMENT**

Elizabeth Keating of the Hydrology, Geochemistry and Geology Group at LANL provided the committee with an overview of the research she has done on aquifer modeling. She explained how computer models of aquifers can be used to help manage water resources by helping stakeholders understand the effects of several different factors on aquifer size and quality. For example, Dr. Keating showed the committee a model of the Espanola Basin to show how surface and ground water are interrelated and how water supplies in Los Alamos are related to the Espanola Basin. She also noted that research has shown that ground water in the basin is contaminated with naturally occurring uranium, fluoride and arsenic, and that the contamination may be growing worse as a result of ground water production.

Questions and comments included:

- runoff compared to percolation into ground water;
- reliability of ground water data given the variability of recharge conditions based on varying vegetative cover throughout New Mexico; and
- damage to aquifers from disposal of mine tailings and surface waste.

### **TOUR OF LOS ALAMOS WATERSHED AND FOREST RECOVERY**

The committee toured several areas of the Los Alamos Watershed to view restoration and forest management techniques that were employed in the aftermath of the Cerro Grande fire.

The committee adjourned at 2:30 p.m.