Permit

Kieling, John, NMENV

ENTERED

From: Concerned Citizens for Nuclear Safety [ccns@nuclearactive.org]
Sent: Friday, February 01, 2008 4:54 PM
To: Kieling, John, NMENV; Rhgilkeson@aol.com
Subject: CCNS/Gilkeson Comments to d LANL permit

Attachments: CCNS-Gilkeson d LANL RCRA 2-1-08.doc

CCNS-Gilkeson d LANL RCRA 2-1-...

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February 1, 2008

By e-mail to: john.kieling@state.nm.us

John E. Kieling, Program Manager
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Re: Comments to August 2007 draft Hazardous Waste Facility Permit
Facility: Los Alamos National Laboratory (LANL)
Facility Owner and Co-Operator: U.S. Department of Energy (DOE)
Facility Co-Operator: Los Alamos National Security, LLC (LANS)
EPA ID No.: NM0899910515

Dear Mr. Kieling:

Concerned Citizens for Nuclear Safety (CCNS) and Robert H. Gilkeson provide the following general and specific comments about the above-referenced permit.

CCNS is a non-governmental organization which formed in 1988 to voice citizen concerns about the transportation of nuclear waste from Los Alamos National Laboratory (LANL) to the then proposed Waste Isolation Pilot Plant (WIPP). For the past 20 years, CCNS has been devoted to its mission *to protect all living beings and the environment from the effects of radioactive and other hazardous materials now and in the future.* Since the Cerro Grande fire in May 2000, CCNS has addressed the water contamination problems at LANL and their impacts on regional drinking water supplies.

Robert H. Gilkeson is a registered geologist, former lead consultant to the groundwater protection program at LANL, and award-winning whistleblower. Gilkeson has written a number of reports and made presentations for the public, regulatory agencies as well as oversight boards about the problems with the drilling of the characterization wells at

LANL with organic drilling fluids and bentonite clay muds which mask the detection of LANL contaminants.[1] His work has been confirmed by the Department of Energy Inspector General,[2] National Academy of Sciences[3] and the Environmental Protection Agency (EPA) Kerr Research Laboratory in Ada, Oklahoma.[4] He has described how the characterization wells do not comply with applicable regulations, including the New Mexico Hazardous Waste Act (HWA) and the federal Resource Conservation and Recovery Act (RCRA), including:

1. The wells are located too far from the boundaries of the waste sites. They are not located within 50 feet of the boundaries as required by RCRA guidance;
2. The sampling well screens are generally not located in the strata with the fast groundwater pathways for the early detection of contaminants;
3. All of the wells are invaded with drilling fluids with well-known properties to hide detection of many LANL contaminants;
4. All of the wells have stainless steel screens that will corrode and hide detection of many LANL contaminants;
6. The wells are not purged sufficiently before sampling is done as required by RCRA and the NMED/LANL Consent Order;
4. Sampling methods which allow the samples to be exposed to air, thereby causing the loss of contaminants prior to analysis;
7. The reporting of contaminants in groundwater, including problems with accessing the LANL Water Quality Database through the Internet.

Our comments do not cover all of the permit sections as we have been responding to other public notices for comments on permits and other documents involving the Buckman well field and proposed diversion project; draft individual storm water permit for LANL; draft Complex Transformation Supplemental Programmatic Environmental Impact Statement; MDA H Remedy Selection; Sandia draft RCRA permit and Long-Term Monitoring and Maintenance for the Mixed Waste Landfill; as well as holding meetings and briefings.

CCNS and Gilkeson make three requests:

1. NMED deny the permit in order to protect human health and the environment; and

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[1] Please see Appendix A.

[2] "Characterization Wells at Los Alamos National Laboratory," DOE/IG-0703, September 2005.

[3] "Plans and Practices for Groundwater Protection at the Los Alamos National Laboratory," Final Report, National Research Council of the National Academies.

[4] "Los Alamos National Laboratory, Los Alamos, New Mexico (01RC06-001) Impacts of Well Construction Practices," September 30, 2005 Memo from the **

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2. If NMED does not deny the permit, then we request a public hearing.
3. Prior to any public hearing, we request negotiations to resolve the many issues raised in these comments, as well as by the Permittees and other Interested Parties.

Request for Public Hearing and Negotiations. For the reasons that follow, CCNS and Gilkeson request a public hearing on the draft RCRA permit for LANL. Further, and prior to any notice of public hearing, pursuant to §20.4.1.901.A.4 NMAC, CCNS and Gilkeson request that NMED, Permittees, CCNS, Gilkeson and other interested parties conduct negotiations to attempt to resolve issues related to the draft permit prior to a hearing. CCNS and Gilkeson believe that the other Interested Parties, Permittees and NMED would agree with some of the concerns and objections raised in the following comments and that a revised draft permit could be developed prior to the public hearing.

In order to address the overall cleanup issues at LANL, we recognize the need for a full discussion about the various solid waste management units (SWMUs) and Areas of Concern (AOCs) covered by the NMED/LANL Consent Order (CO), the draft RCRA permit and the draft individual NPDES storm water permit. We suggest that representatives from the Environmental Protection Agency (EPA) be invited to participate in the negotiations, when appropriate.

Over the years, there has been a lack of efficiency in cleanup activities at LANL. Now that LANL contaminants are in our drinking water, we must all work efficiently and effectively to eliminate the transport of LANL contaminants to water resources. Further, global warming and climate change will result in greater demands on the precious ground water resources and increase the danger of groundwater contamination from LANL wastes.

We suggest that the negotiations result in a master list of SWMUs, AOCs and regulated units, with a designation whether they are covered by the CO, RCRA permit or NPDES permit. The designation must include the schedule under the appropriate enforceable document. We envision that the master list will be similar to the schedules found in Section XII of the CO.

We also suggest that representatives from our congressional delegation participate in the negotiations as observers when discussions about cleanup funding and prioritization occur. The recommended master list will give us a good idea about the funding needs in order to meet all of the requirements under the various enforceable documents. It will assist DOE in preparing their five-year work plans and budgets and their funding requests to Congress.

CCNS participated in the 17-days of negotiations following the release of the draft RCRA permit for the WIPP in the spring of 2005. We found the negotiation process to

be a productive way to reduce the number of issues through a consensus process among the NMED, Permittees and Interested Parties.

Alternative Dispute Resolution (ADR). CCNS and Gilkeson request that the negotiations are conducted under the purview of Governor Richardson's Alternative Dispute Resolution Executive Order. Executive Order 2005-047. We request that someone from the NMED Office of Public Facilitation or ADR Council facilitate the negotiations.

CCNS and Gilkeson request that NMED fully consider the all the comments and issue a revised draft permit before proceeding to a public hearing.

A. NMED MUST DENY THE PERMIT

NMED must deny the permit for the following reasons:

1. LANL operations have created a "substantial adverse environmental impact," as defined in the New Mexico Hazardous Waste Act (NM HWA). Hazardous and toxic, as well as radioactive, contamination has been transported through surface water and to ground water, both on and off the LANL site,

2. In May 2002, NMED made a "Determination of an Imminent and Substantial Endangerment to Human Health and the Environment" for LANL. NM HWA, NMSA §§ 74-4-10.1. NMED withdrew its determination based on lengthy negotiations with the Permittees. The public was excluded from the negotiations. We declare that the determination of an "imminent and substantial endangerment" still exists at LANL as a result of current and legacy operations. Examples include:

a. The Cerro Grande fire occurred eight years ago and some of the highest concentrations of radionuclides and other toxic and hazardous contaminants have been transported through the canyon systems to the Rio Grande. For example, contaminants have been found in surface water, including PCBs at 25,000 times the human health standard;

b. Contaminants have been found in the regional aquifer, including hexavalent chromium at eight times the New Mexico Water Quality Commission standard and four times the EPA standard. Although the Permittees discovered the contamination in January 2004, we still don't know the nature, extent and direction of the plume;

c. There is no reliable groundwater-monitoring network as required by RCRA, DOE Orders and standard industry practice.

d. Major seismic issues are outstanding. The Defense Nuclear Facilities Safety Board (DNFSB) reported a 50% increase in the magnitude of a potential seismic event at LANL.

e. DOE plans to expand plutonium pit production at LANL. Complex Transformation Supplemental PEIS, DOE/EIS-0236-S4. Environmental justice issues have not been properly addressed at LANL. The minority population in the region of influence (ROI), a 50-mile radius from LANL, is 57 percent within the census tracts containing LANL. Id., p. 57. The low-income population in the ROI is 9.3 percent. Id.

f. The purpose of the NM HWA is "to help ensure the maintenance of the quality of the state's environment; to confer optimum health, safety, comfort and economic and social well-being on its inhabitants; and to protect the proper utilization of its lands." NMAC 74-4-2. The Hazardous Waste Bureau is charge with implementing the HWA. By issuing a final permit for LANL, NMED is not fulfilling the purpose of the HWA.

g. There are long-standing patterns and practices which hinder compliance with applicable laws, regulations and standards at LANL.

There are too many uncertainties about the water and soil contamination at LANL to allow them to continue operations with hazardous materials. NMED must therefore deny the permit.

B. GENERAL COMMENTS

1. New Mexico Constitutional Requirements. Article XXII of the New Mexico Constitution states that protection of the environment is essential in balance with economic interest. LANL has demonstrated that it cannot protect the environment and public health and conduct research, development, testing and manufacturing of nuclear weapons. LANL has not done the necessary work to contain contaminants as required by the law and common sense. It has emitted radioactive, hazardous and toxic constituents into the air, discharged them into surface water, thus distributing them for transport into ground water and redistribution into the air, as well as burial of them in unlined pits, trenches and shafts, which continues today. These activities are inconsistent with what the framers of the New Mexico Constitution intended.

The New Mexico Environment Department (NMED) has not fulfilled its requirements under the New Mexico Constitution to protect the health and well being of the people of New Mexico. Some recent examples include:

1. LANL discovered chromium in the regional aquifer in January 2004. Four year later, the necessary information is not known about the nature, extent and direction of

the plume. We don't know if the contamination has left the LANL site, but more than likely, it has.

2. In June 2006, DOE reported contamination in the drinking water wells for Los Alamos County and the City of Santa Fe. Draft LANL Site-Wide Environmental Impact Statement.

3. In June 2007, the City of Santa Fe reported plutonium-238 in the Buckman Well No. 1, the well closest to the Rio Grande on the east side of the river.

4. In May 2007, NMED DOE Oversight Bureau reported plutonium in an old river slough north of the proposed site for the proposed Buckman Direct Diversion Project.

5. In 2004, the NMED DOE Oversight Bureau reported the transport of the highest concentrations of plutonium in storm water and sediments through the Pueblo Canyon system.

These are all examples of releases from hazardous waste sites which are regulated by 40 CFR §§ 264.90 to 101, "Releases from Hazardous Waste Sites." We are concerned that in many cases, neither NMED nor the Permittees cite the entire section as being applicable. Specifically, sections 100 and 101 impose additional requirements on the Permittees upon the discovery a release.

Further, corrective action is required for contamination found beyond the facility boundary. 42 U.S.C. § 6924(v) and 20.4.1.500 NMAC, incorporating 40 CFR § 264.101(c). Above are recent examples of contamination found beyond the facility boundary requiring corrective action.

Draft Permit and NMED/LANL Consent Order Are Not Parallel Documents, Thus Creating Loopholes for Enforcement, Funding and Creating General Confusion.

CCNS wrote the following December 19, 2007 email to NMED to clarify information about the integration of the Consent Order with the draft RCRA permit.

1. In Section III.W.1 of the March 1, 2005 NMED/LANL Consent Order, "Integration with Permit, General," there are four exceptions for corrective action that "will be addressed in the Permit and not in this Consent Order." Number 2 reads, "the closure and post-closure care requirements of 20.4.1.500 NMAC (incorporating 40 CFR Part 264, Subpart G), as they apply to *operating units* at the Facility" [emphasis added]. Operating units are not defined in the Consent Order.
2. The preface language to Section 11.2 of the August 2007 draft LANL RCRA Permit, "Corrective Action Requirements Under the Permit," states: "Section III.W.1 of the Consent Order expressly identifies four circumstances in which corrective action is to be conducted under this Permit (or other enforceable document) rather than the Consent Order."
3. Number 2 reads, "the closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they apply to *permitted units* at the Facility" [emphasis added].
4. In Section 1.8 of the draft LANL RCRA permit, "Definitions," a permitted unit "means a hazardous waste management unit that is: 1) actively managing waste or in closure or post-closure care; 2) addressed by this Permit; 3) not an interim status unit; and 4) listed in Attachment O (Hazardous Waste Management Units), Table O-1 (Permitted Units Actively Managing Hazardous Waste), or Table O-2 (Permitted Units Undergoing Post-Closure Care), or Table O-4 (Permitted Units Undergoing Closure."

The Consent Order carefully delineates that the operating units were outside the NMED/LANL Consent Order and would be covered by the RCRA permit. Yet, Section 11.2 of the draft LANL RCRA permit refers to permitted units, not operating units. Given the complicated history of operating units versus permitted units at LANL, CCNS requests:

1. a list of all of the operating units exempted from coverage under the NMED/LANL Consent Order; and
2. a list of all of the permitted units covered by the draft LANL RCRA permit.

Further, we are very concerned that the draft LANL RCRA permit misrepresents the wording in the Consent Order. In order to make informed comments, the public expects that regulatory language will track between the Consent Order and draft LANL RCRA permit.

We look forward to your written response, and now understand that it will require additional time to make informed comments about the draft LANL RCRA permit.

Please inform us at your earliest convenience about when we may expect to receive the two lists. Thank you.
Joni

Unfortunately, the NMED response was less than forthcoming about the difference between the "operating units" and the "permitted units." The response continues to propagate general confusion. We request that this topic be one of the first during the negotiations.

We request that the Consent Order incorporate the draft RCRA permit and the draft RCRA permit incorporate the Consent Order.

A lot of time, effort and resources have been invested in addressing LANL contaminant issues. We are committed to working with the Bureau, the Permittees and other Interested Parties. Our goals are to ensure that the draft permit, Consent Order and other permitting cover all the 2,129 LANL sites.

B. SPECIFIC COMMENTS

1. RESRAD. On January 3, 2008, CCNS received an email from Charley Yu, PhD, CHP, RESRAD Program Manager, Environmental Science Division, Argonne National Laboratory that Argonne National Laboratory released new versions of RESRAD (onsite) (V.6.4) and RESRAD-BUILD (V.3.4) codes.

> "These codes now share the same radionuclide database and include ICRP 72 age-dependent dose conversion factors. RESRAD codes can be downloaded from the RESRAD web site (http://www.evs.anl.gov/resrad). Both codes have been tested successfully on Windows Vista and XP operating systems. The development of RESRAD codes are sponsored by the U.S. Department of Energy and U.S. Nuclear Regulatory Commission. For questions and comments on RESRAD codes, please send email to resrad@anl.gov."

CCNS and Gilkeson request that NMED and the Permittees adopt the latest RESRAD code revisions and include the age-dependent dose conversion factors in all RESRAD analyses required under the Consent Order and RCRA permit.

2. NMED Must Retract the Approval of the LANL Well Screen Analysis Report – Revision 2. The NMED Hazardous Waste Bureau issued an approval letter on May 25, 2007 for the LANL *Well Screen Analysis Report-Revision 2* (WSAR-2). The NMED approval was despite the findings of the National Academy of Sciences (NAS) and the EPA Kerr Laboratory that there was a lack of basic scientific knowledge in the scheme used in the LANL WSAR reports and the assessment of only water quality data could not be used to determine that any of the screened intervals in the LANL characterization wells produced reliable and representative water samples.

Indeed, the NMED approval letter identified that the assessment scheme in the WSAR-2 could not prove that any of the screened intervals produce reliable water samples for detection of the strongly adsorbing radionuclides including isotopes of plutonium, americium, neptunium, cerium and cesrium. The pertinent part of the NMED letter is pasted below:

> "NMED notes that the conclusions obtained in the [WSAR-2] Report were derived mainly from analysis of extent data in the literature, possible under conditions different from the Los Alamos National Laboratory's site (the site). The absence of critical site-specific data, such as adsorption properties, reaction kinetics and microbial activities, implies that there would be uncertainties and limitations in using the methodology developed in the Report to assess the quality of groundwater samples collected from monitoring wells installed at this site. NMED is especially concerned about the uncertainty with respect to monitoring certain potential contaminants of concern, such as the highly adsorptive radionuclides. NMED therefore suggests that the Permittees consider conducting proper laboratory and field studies to address the uncertainty regarding whether or not the mentoring wells installed as the monitoring network are capable of providing reliable data to monitor potential releases of the highly adsorptive radionuclides from operation of the Laboratory to groundwater."

The NMED concerns about the failure of the WSAR-2 to be based on critical site-specific data, and the need for LANL to conduct laboratory and field studies to address uncertainty in the assessment scheme is reason alone for NMED to not approve of the flawed WSAR-2.

It is now imperative for the NMED to retract the approval of the WSAR-2 because of the decision of the Northern New Mexico Citizens' Advisory Board (CAB) to have the EPA Kerr Laboratory do a new review of the report. In addition, LANL submitted PowerPoint presentation materials to the January 9, 2008 meeting of the EMSR Committee of the CAB that show only 44 of the 80 screened intervals in the LANL characterization wells produce reliable water samples for the detection of dissolved zinc. This finding is in contrast to the claim in the WSAR-2 that all 80 screened intervals provide reliable detections of zinc and hence data for those metals and

radionuclides for which zinc can be considered a suitable indicator should also be reliably detected. The pertinent statements from the WSAR-2 are pasted below:

- One hundred percent of the 15 well screens [invaded with bentonite clay] provide reliable detections of zinc and hence data for those metals and radionuclides for which zinc can be considered a suitable indicator should also be reliably detected, if present (p.33).

- One hundred percent of the well screens [invaded with organic drilling additives] provide reliable detections of those metals for which zinc can be considered a suitable indicator. The detection rate was also 100% for the screens drilled with bentonite (p. 34).

The LANL presentation materials to the January 9, 2008 CAB meeting make the claim that only 55% of the screened intervals provide reliable detections of zinc i.e., 25 screened intervals in multiple-screen wells and 19 single-screen wells. Even the claim that these wells produce reliable water samples is without basis to the facts.

No-purge sampling methods prevent multiple-screen wells from producing usable water samples. In fact, the multiple-screen wells do not produce reliable water samples for detection of any constituents or contaminants because of the no-purge methods that are used to collect water sample. The NMED Consent Order requires water to be purged from each screened interval for a sufficient period of time to ensure collection of reliable and representative samples.

In addition, the NMED issued a Notice of Dissaproval on September 18, 2006 for the WSAR-1 that described the need to purge a sufficient volume of water from the LANL characterization wells:

"The sampling method, specifically whether purging is conducted before collection of samples, may play a crucial role in determining the quality of water samples. This is especially critical if residual drilling fluids and bentonite are present around screened intervals in the affected wells. According to *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers* (EPA 542-S-02-001, 2002), monitoring wells must be purged so that water samples representative of formation water can be obtained." (p. 2 of NMED NOD)

"Stagnant water is subject to physiochemical and biological changes when organic compounds contained in drilling fluids are present, often resulting in anaerobic water that is chemically different from formation water. As a result, no-purge sampling methods cannot assure collection of water samples that are not impacted by the stagnant or chemically altered water. Purging is a safeguard against collecting a sample biased by stagnant water. Purging is also an efficient way to

reduce the contact time of formation water with a screen and any surrounding area impacted by drilling fluids or other anthropogenic influences on water quality, which helps to minimize the potential influence of such factors on water sample quality." (p. 2 of NMED NOD)

The need to purge a sufficient volume of groundwater from the LANL characterization wells was described in the Final Report of the National Academey of Sciences on the *Plans and Practices for Groundwater Protection at the Los Alamos National Laboratory,* Summer, 2007:

> *"[A]pplication of proper purging techniques in both well development and groundwater sampling is necessary for collection of representative groundwater samples, especially in the regional aquifer. The most trustworthy sampling technique includes purging three or more well volumes from the monitoring well before sample collection [emphasis added] (ASTM D 4448, 1992). While this method requires containment and potential treatment of much more water than the minimum-purge techniques, it better ensures that samples from the developed wells represent the conditions in the nearby aquifer. Purging is much easier to control and complete with single-screened monitoring wells."* (p. 56).

It is imperative for NMED to require LANL to stop using no-purge water samples and for NMED to 1). refuse to accept water quality data that is collected with no-purge methods, and 2). refuse to accept reports such as the WSAR-2 with findings based on no-purge water samples.

The study of trends is proof that practically all of the LANL single-screen wells in the WSAR-2 do not produce reliable water samples for detection of dissolved zinc and other trace metals. Table 1 presents the dissolved and total zinc data for 23 single-screen wells for all of the sampling events from the first to the most recent water samples. A study of the trends over time in water quality data procuced from monitoring wells is the standard industry practice but this study was not part of the scheme in the LANL WSAR reports. However, the trends presented in Table 1 are proof that none of the 23 wells produce reliable water samples for detection of dissolved zinc, and accordingly, the wells do not produse usable water samples for the detection of other trace metals or the strongly sorbing radionuclides including plutonium, americium, neptunium, cerium, and cesium. The data in Table 1 are proof that NMED must retract the approval of the WSAR-2.

Table 1-A. Dissolved Zinc Data For the LANL Single-Screen Characterization Wells Drilled With the Mud-Rotary Method Into the Regional Aquifer. The screens are invaded with both bentonite clay and organic fluids.

The four single-screen wells in this table are invaded with both bentonite clay and organic drilling additives.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-2	10.1	(04-26-05)	14.8	< 2 PEB
	< 7.4 J	(08-09-05)	11.1	
	5.6 J	(11-09-05)	9.4	
	< 7.3 J	(02-27-06)	< 10	< 2.3 FB < 2 PEB
	< 8 J	(07-24-06)	13.5	
	6 J	(04-17-07)	15.9	
	6.8 J	(07-16-07)	5.4 J	

Well R-1 is not reliable for detection of dissolved zinc because of the 40% decline in dissolved zinc from 10.1 ug/L in the first sample to 6.1 ug/L in the most recent sample.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-4	29	(10-10-03)	NA	
	7.7 J	(04-27-05)	7.4 J	
	< 4.1 J	(08-08-05)	< 4.4 J	
	< 2 U	(11-04-05)	< 2 U	
	< 4.4 J	(02-28-06)	< 3.7 J	< 3.2 FB
	< 9.9 FD J	(02-28-06)	< 3.9 FD J	
	< 4.1 J	(07-25-06)	< 3.5	< 3.1 FB
	< 4.8 FD J	(07-25-06)	< 3.5 FD J	
	< 2 U	(04-17-07)	< 2 U	
	< 2 U	(07-18-07)	< 2 U	

Well R-4 is not reliable for detection of dissolved zinc because of the > 95 % decline in dissolved zinc from 29 in the first sample to < 2 (not detected) ug/L. Zinc was not detected in the two most recent water sampling events

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-6	< 8.7 J	(08-23-05)	< 12.9	< 3.1 FB
	< 6.9 FD J	(08-23-05)	< 9.3 FD J	
	< 2 U	(11-17-05)	< 2 U	
	3.7 J	(03-01-06)	12.7	< 2 FB
	< 10.2	(05-11-06)	< 10.3	< 3 FB
	< 6.4 J	(07-26-06)	< 26.1	
	< 17.8 FD	(07-26-06)	< 29.3	
	< 2 U	(04-12-07)	8.1 J	
	2.4 J	(07-17-07)	5.3 J	

Well R-6 is not reliable for detection of dissolved zinc because of the >75% decline from < 8.7 to < 2 (not detected) ug/L in 2 samples and the estimated value of 2.4 ug/l in the most recent water sample.

Table 1-A. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- R-23	1.13 B	(12-17-03)	< 0.883 U
	30.5	(03-23-04)	22.6

29.3 FD	(03-23-04)	23.6 FD
12	(06-29-04)	10.5
11.3 FD	(06-29-04)	10.4 FD
< 5.5	(09-24-04)	< 5 J
18.4	(07-14-05)	< 11
16.1 FD	(07-14-05)	< 12.3
2.5 J	(08-15-06)	3.7 J
< 2 U FD	(08-15-06)	2.6 FD J
< 2.2 J	(12-18-06)	40.1
< 2 U FD	(12-18-06)	< 3 FD J
< 2.8 J	(03-19-07)	< 5.8 J
< 3 FD J	(03-19-07)	< 5.2 FD J
< 2 U	(06-25-07)	< 2 U
< 2 U FD	(06-25-07)	< 2 U FD
< 2 U	(09-06-07)	< 2 U
< 2 U FD	(09-06-07)	< 2 U FD

Well R-23 is not reliable for detection of dissolved zinc because of the >97% decline from 26 to < 2 (not detected) ug/L. Zinc was not detected in the 2 most recent sampling events

PEB = Performance Evaluation Blank
FB = Field Blank
FD = Field Duplicate
B = Reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).
J = Listed numeric value is an estimated quantity.
U = Zinc was not detected in the water sample.
NA = Designated water sample was not analyzed for zinc.

Table 1-B. Dissolved Zinc Data For the LANL Single-Screen Characterization Wells In the Regional Aquifer With Screens Invaded With Organic Drilling Additives.

Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
R-1	1.4	(11-25-03) sample collected after well development		
	7.6 J	(05-19-05)	< 7.3 J	< 2 FB
	2.7 J	(09-12-05)	3.1 J	< 2 FB
	< 2 U FD	(09-12-05)	3.5 J FD	
	< 2 U	(11-28-05)	< 2 U	
	< 2 U	(01-25-06)	< 2 U	< 2 PEB
	5.1 J	(07-06-06)	4 J	
	3.9 FD J	(07-06-06)	4.9 FD J	
	2.3 J	(10-26-06)	< 2 U	
	< 2 U FD	(10-26-06)	< 2 U FD	
	3.3 J	(03-07-07)	3.1 J	
	2.1 J	(06-11-07)	2.3 J	
	6.6 FD J	(06-11-07)	< 2 U FD	
	3.5 J	(08-13-07)	4 J	

Well R-1 is not reliable for detection of dissolved zinc because of the great variation in measured values for dissolved zinc from ~7 to < 2. Data cannot be used to determine accurate background value for dissolved zinc

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-9	< 3.4 B	(02-28-00)	9.1 B	
	< 7.5 B	(09-29-00)	< 12 B	
	< 9.8 B	(02-13-01)	< 16 B	
	< 4.9 B	(05-15-01)	15 B	
	NA	(12-12-03)	< 1.58 B	
	NA	(05-27-04)	12.3	
	NA	(04-28-05)	< 2.7 J	
	< 2.1 J	(07-31-06)	< 4.2 J	< 2.3 FB
	< 2 U FD	(07-31-06)	< 2.6 J FD	
	< 2 U	(04-10-07)	< 3.2 J	
	< 2 U FD	(04-10-07)	< 3.4 J FD	
	< 2 U	(07-19-07)	2.3 J	

Well R-9 is not reliable for detection of dissolved zinc because the data is of poor quality but shows a decline over time in measured values to dissolved zinc not detected in the 2 most recent sampling events.

Table 1-B. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-10a	160	(09-07-05)	NA	
	111	(11-30-05)	150	
	42.2	(02-01-06)	87.3	< 2 U PEB
	18	(07-17-06)	64	
	14.8	(10-12-06)	54	
	15.4 FD	(10-12-06)	53.8 FD	
	28.8	(02-20-07)	55.4	
	8.3	(06-19-07)	27.5	
	9.3 FD	(06-19-07)	29.9	
	7.5	(08-15-07)	17.5	

- Well R-10a is not reliable for detection of dissolved zinc because of the >95% decline over time in dissolved zinc from 111 to 7.5 ug/L in most recent sample.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-11	< 8.9	(05-17-05)	12.5	< 2.5 FB
	< 10.4 FD	(05-17-05)	12.5 FD	
	16	(11-08-05)	12.1	
	11.2 FD	(11-08-05)	11.8 FD	
	17.6	(02-03-06)	19.9	
	37	(07-10-06)	25.1	< 6.8 FB
	27.2 FD	(07-10-06)	21.1 FD	
	17.7	(10-10-06)	16.9	

17.2 FD	(10-10-06)	17.3 FD
16.5	(02-13-07)	17.1
14.6 FD	(02-13-07)	18.5 FD
11.6	(06-13-07)	11.8
10.5	(08-17-07)	11.6

- Well R-11 is not reliable for detection of dissolved zinc because of the great change in measured values of dissolved zinc from 27.6 to < 8.9 ug/L and 10.5 ug/L in most recent sample. There is a 60% decline from 27.6 to 10.5 ug/L.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-13	5.53	(04-18-02)	6.69	
	5.78	(07-03-02)	< 3.17 B	
	< 3.49 B	(10-28-02)	< 2.98 B	
	< 5 U	(01-27-03)	< 5 U	
	NA	(12-29-03)	< 1.46 B	
	< 2 U	(02-02-06)	< 2 U	
	< 3 J	(07-03-06)	< 2.4 J	
	< 2.5 J	(10-25-06)	< 2.1 J	<2.1 J FB
	< 4 J	(02-28-07)	< 5.2 J	
	< 2 U	(06-12-07)	< 2 U	
	< 2 U	(08-16-07)	< 2 U	

- Well R-13 is not reliable for detection of dissolved zinc because of the >65% decline in dissolved zinc from 5.78 to < 2 (not detected) ug/L. Dissolved zinc was not detected in the two most recent sampling events.

Table 1-B. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- R-15	< 2.8 U	(02-24-00)	< 4.9 U
	< 6.9 U	(10-10-00)	< 15 U
	7.1 B	(02-15-01)	3.6 B
	< 0.31 B	(05-22-01)	< 0.31 B
	NA	(12-15-03)	< 2.08 B
	NA	(12-15-03)	< 2.41 B
	NA	(06-10-04)	< 0.883 B
	< 2 U	(05-25-05)	2.5 J
	< 2 U FD	(05-25-05)	< 2 U FD
	< 9.1 J	(08-31-05)	< 10.6
	< 2 U	(01-30-06)	< 2 U
	< 3.2 J	(07-03-06)	< 2.9 J
	< 3.2 J	(10-24-06)	< 3.1 J
	< 2.3 J FD	(10-24-06)	< 2.5 J FD
	< 4.3 J	(02-28-07)	< 5.6 J
	< 2 U	(06-12-07)	< 2 U
	< 2 U	(08-16-07)	< 2 U

Well R-15 is not reliable for detection of dissolved zinc because of the great variation in measured values of dissolved zinc from ~ 9 to < 2 (not detected) ug/L. Zinc was not detected in the 2 most recent water sampling events.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-16r	57	(10-17-05)	NA	value from R-16r well completion report
	< 5.5 J	(12-19-05)	< 6.9 J	
	< 7.1 J	(03-08-06)	< 11	< 2 U FB
	< 7.6 FD J	(03-08-06)	< 7.6 FD J	
	< 9.3 J	(05-24-06)	< 12.3 J	< 2.3 J FB
	< 7.6 J	(08-17-06)	< 10 J	< 2 U PEB < 10 J FB
	< 7.2 J FD	(08-17-06)	< 11.2 FD	
	12.7	(11-01-06)	12.5	< 2 U PEB
	< 11.8	(03-14-07)	< 13.7	
	< 11.6 FD	(03-14-07)	< 12.6 FD	
	56.9	(06-13-07)	11.2	
	9.7 FD	(06-13-07)	10.9 FD	
	7.8	(08-20-07)	10.5	

Well R-16r is not reliable for detection of dissolved zinc because of the great variation in measured concentrations of dissolved zinc with an 86% decline over time from 57 ug/L to 7.8 ug/L in the most recent water sample.

Table 1-B. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- R-17	96.2	(10-17-06)	125
	94.7	(10-19-06)	202
	3.1	(02-22-07)	4.6
	3 FD	(02-22-07)	4.7 FD
	22.5	(02-22-07)	80
	< 9 J	(04-25-07)	19.8
	< 5.5 J FD	(04-25-07)	18.7 FD
	< 2 U	(04-25-07)	2.9 J
	5.1 J	(07-03-07)	7.3 J
	< 2 U	(07-03-07)	2.1 J
	< 2 U	(09-18-07)	8.1J
	< 2 U	(09-18-07)	< 2 U

The well completion report is not available on the LANL water quality website. There appears to be 2 screened intervals. Well R-17 is not reliable for detection of dissolved zinc because both screens show a > 95% decline from ~ 95 to < 2 (not detected) ug/L. Dissolved zinc was not detected in the most recent water sample collected from either of the 2 screens.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-18	< 5.4 J	(08-25-05)	< 5.8 J	< 2.6 J FB
	< 2 U	(12-01-05)	< 2 U	
	< 2 U FD	(12-01-05)	< 2 U FD	

12.3	(03-07-06)	2.2 J	< 2 U FB	< 2 U PEB
2.5 J	(05-16-06)	20.7	< 2 U FB	< 2 U PEB
3.1 J FD	(05-16-06)	3.1 J FD		
< 4 J	(08-15-06)	< 4.9 J		
< 4 J FD	(08-15-06)	< 6.5 J FD		
< 2.1 J	(12-18-06)	< 2.6 J		
< 3.5 J FD	(12-16-06)	< 2.2 J FD		
< 3.2 J	(03-22-07)	2.7 J		
< 4.3 J FD	(03-23-07)	2.4 J FD		
< 2 U	(06-26-07)	4.5 J		
2.6 J FD	(06-26-07)	2.2 J FD		
< 4 J	(09-04-07)	< 2.3 J		

Dissolved zinc data from well R-18 is of poor quality as shown by measured values in unfiltered samples often much lower than corresponding values in filtered samples and the range for dissolved samples from 12.3 to < 2 (not detected) ug/L with the most recent estimated values of < 4 ug/L for dissolved zinc and < 2.3 ug/L for total zinc.

Table 1-B. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-21	7.58	(03-31-04)	5.81	
	4.42 FD	(03-31-04)	5.51 FD	
	7.81	(06-30-04)	16	
	< 2.8 J	(09-23-04)	< 3.5 J	
	7.4	(12-14-04)	7.8	
	< 2.9 J	(06-06-05)	< 3 J	
	< 2 U FD	(06-06-05)	< 2.3 J FD	
	< 3 J	(07-07-06)	< 3.6 J	
	< 2.7 J	(11-06-06)	< 3.6 J	< 2.9 J FB
	< 5.6 J FD	(11-06-06)	< 4.2 J FD	
	< 2.7 J	(03-15-07)	< 4.7 J	
	6.5 J	(06-13-07)	2.3 J	
	< 2 U	(08-20-07)	< 2 U	

Well R-21 is not reliable for detection of dissolved zinc because of the > 75% decline in dissolved zinc from 7.81 to < 2 (not detected) ug/L. Dissolved zinc was not detected in the most recent water sampling event.

The well development was completed by 12-05-2002 and a pumping test was performed on 01-15-2003. No water samples were collected during the well development or the pumping test. The first water quality data in the LANL website is after a period of 15 months from well development.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-27	65.5	(07-01-06)	65.7	
	65.6 FD	(07-01-06)	66.7 FD	
	< 6.9 J	(02-02-07)	41.4	2.7
	< 2 U	(03-30-07)	2.8 J	
	< 2 U FD	(03-30-07)	< 2 U FD	

< 2 U	(05-11-07)	< 2 U	< 2 U FB
< 2 U	(10-26-07)	< 2 U	
< 2 U FD	(10-26-07)	< 2 U FD	

Well R-27 is not reliable for detection of dissolved zinc because of the > 97% decline in measured concentrations of dissolved zinc from 65.6 to < 2 (not detected) ug/L. Dissolved zinc was not detected in the 3 most recent sampling events.

Table 1-B. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-28	11	(05-20-05)	11.6	< 2 FB
	< 13.6	(09-01-05)	< 7.1 J	
	< 3.1 J	(11-10-05)	2.6 J	
	< 9.1 J	(01-26-06)	< 7 J	
	< 4.7 J FD	(01-26-06)	< 5.5 J FD	
	< 6.9 J	(07-05-06)	< 4 J	
	< 3.6 J	(10-26-06)	< 3.3 J	
	< 3.8 J	(03-06-07)	4.5	
	< 3.5 J FD	(03-06-07)	3.4 J FD	
	2.1 J	(06-13-07)	3 J	
	< 2 U	(08-17-07)	< 2 U	

Well R-28 is not reliable for detection of dissolved zinc because of the > 85% decline in measured concentrations of dissolved zinc from 11 to < 2 (not detected) ug/L. Dissolved zinc was not detected in the most recent sampling event.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-34	4 J	(06-07-05)	8.5	< 2 U FB
	< 2.2 J	(09-07-05)	< 9.9 J	
	< 2 U	(11-29-05)	5.1 J	
	< 2 U FD	(11-29-05)	41.7 FD	
	2.65 J	(01-31-06)	11.3	
	< 3.6 J	(07-17-06)	< 9.2 J	
	4.5 J	(10-30-06)	7.3 J	< 2 U FB
	< 5.5 J	(03-13-07)	< 7.7 J	
	< 2 U	(06-20-07)	< 2 U	
	< 2 U	(08-14-07)	3.2 J	
	< 2 U FD	(08-14-07)	2.7 J FD	

Well R-34 is not reliable for detection of dissolved zinc because of the > 50% decline in measured values for dissolved zinc from 4 to < 2 (not detected) ug/L. Dissolved zinc was not detected in the 2 most recent water samples. The well development was completed on September 2, 2004. No water sample was collected after well development for a period of 8 months.

Dissolved zinc values measured in wells R-35a and R-35b where casing advance drilling methods prevented any drilling fluids other than air from invading the screened intervals.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- R-35a	185	(08-30-07)	364
- R-35b	60.4	(08-29-07)	105
	59.4 FD	(08-29-07)	106 FD

Table 1-C. Dissolved Zinc Data For the LANL Single-Screen Characterization Wells installed In the Perched Zones of Saturation With Screens Invaded With Organic Drilling Additives.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- R-6i	24.6	(08-24-05)	72.1	< 2.9 J FB
	12.9	(11-17-05)	18.1	
	16.5	(03-01-06)	29.9	
	< 12.4	(05-11-06)	< 13.2	
	45.7	(07-26-06)	< 9.6 J	
	14.3	(04-12-07)	6.4 J	< 2 U FB
	6 J	(07-17-07)	7.3 J	< 2 U FB

Well R-6i is not reliable for detection of dissolved zinc because of the > 75% decline in dissolved zinc from 24.6 ug/L in the first sample to 6 ug/L in the most recent.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- R-23i	31.3	(10-03-06)	42.2
	22.6 FD	(10-03-06)	43.1 FD
	4.2	(10-11-06)	262
	< 2 U	(02-26-07)	2.9 J
	< 2 U FD	(02-26-07)	< 2 U FD
	< 9.3 J	(02-28-07)	< 22
	7 J	(04-23-07)	2.6 J
	8.3 J	(04-24-07)	7.6 J
	< 2 U	(06-20-07)	6.9 J
	< 2 U FD	(06-20-07)	< 2 U FD
	4.3 J	(09-06-07)	2.8 J
	3.6 J FD	(09-06-07)	3.2 J FD

The data are for 2 screened intervals but the discrete screens are not identified in the LANL website. Well R-23i is not reliable for detection of dissolved zinc because both screened intervals show a decline over time in measured zinc levels of > 50% to > 90% with zinc < 2 ug/L (i.e., zinc not detected) in 2 of the sampling events.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- CdV-16-1(i)	< 12.3	(06-01-05)	38.2
	10	(08-29-05)	12.5
	10.5 FD	(08-29-05)	11.3 FD
	7.5 J	(12-07-05)	8.9 J
	< 13.1	(03-09-06)	< 14.7
	7.9 J	(05-21-07)	8.2 J

	5.8 J	(10-22-07)	6.4 J	

Well CdV-16-1(i) is not reliable for detection of dissolved zinc because of the 50% decline in measured values of dissolved zinc from >12.3 and 10.2 ug/L in the first samples to an estimated value of 5.8 ug/L in the most recent.

Table 1-C. (Continued)

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L	
- CdV-16-2(i)r	17	(12-15-05)	22.5	
	10.2	(03-15-06)	62.4	< 2 U FB
	5.6	(05-17-06)	27.5	
	< 7.8 J	(02-25-07)	18.6	< 2.2 J FB
	< 8.1 J FD	(02-25-07)	22.2	
	< 5.5 J	(05-10-07)	97.4	< 2 U FB

Well CdV-16-2(i)r is not reliable for detection of dissolved zinc because of the > 67% decline in measured values of dissolved zinc from 17 ug/L in the first sample to < 5.5 ug/L in the most recent.

Dissolved - Well No.	Zinc ug/L	Total Sample Date	Zinc ug/L		
- LAOI-7	23	(09-30-05)	NA	sample collected after well development	
	< 8.3 J	(05-09-06)	18.7		
	< 8.8 J FD	(05-09-06)	15.2 FD		
	< 14.8 J	(08-01-06)	18.6		
	< 16 FD	(08-01-06)	26.1 FD		
	< 15	(11-07-06)	< 8 J		
	< 10.2 FD	(11-07-06)	< 12.3 FD		
	< 24.7	(02-15-07)	14.9		
	< 24.9 FD	(02-15-07)	17.7 FD		
	3.1	(04-18-07)	13.9	< 2 U FB	
	15.1 FD	(04-18-07)	9.9 J		
	6.8 J	(07-19-07)	8.4 J	< 2 U FB	< 2 U PEB

Well LAOi-7 is not reliable for detection of dissolved zinc because of the > 70% decline in measured values of dissolved zinc from 23 ug/L in the first sample to the estimated value of 6.8 ug/L in the most recent.

- Well No.	Dissolved Zinc ug/L	Sample Date	Total Zinc ug/L
- MCOI-5	145	(06-09-05)	382
	137	(09-09-05)	370
	123	(01-27-06)	183
	< 11	(06-26-06)	126
	10 J	(10-19-06)	18.1
	15.6 FD	(10-19-06)	20.2 FD
	< 5.5 J	(03-25-07)	< 7.3 J
	< 3.3 J	(06-04-07)	< 3 J
	4.4 J	(08-23-07)	2.8 J

2.2 J FD (08-23-07) 2.9 J FD

Well MCOI-5 is not reliable for detection of dissolved zinc because of the > 95% decline in measured values of dissolved zinc from 145 ug/L in the first sample to ~3 ug/L in the most recent.

3. **Need to Discuss Extending Consent Order Schedule.** The March 1, 2005 Order on Consent must be made a part of the final permit and incorporated by reference. Under the current regulatory scheme, the Consent Order and Permit operate independently of each other and in an arbitrary fashion. Such inclusion will promote public involvement in characterization activities that must be done to increase transparency for both NMED and the Permittees and will improve the remedies that are needed, once adequate characterization is complete. It is obvious that NMED should use the characterization data produced under the Consent Order to implement corrective action under the final permit.

A discussion must begin about extending the schedule in the Consent Order. The necessary groundwater data does not exist to make corrective action decisions that meet the regulatory requirements. Since June 2004, Gilkeson has documented the many problems with the regional wells drilled under the Hydrogeologic Workplan, including:

a. The wells were not drilled in the correct locations. EPA guidance states that:

b. The screens were not installed in the correct geologic strata. In many cases, the screens were installed in strata with the lowest permeability. The screens should have been installed in the strata with the fast groundwater pathways.

c. The use of stainless steel screens, which can corrode and set up an environment for microbes and bacteria to bloom and change the ambient water chemistry. NMED has addressed these concerns at Sandia National Laboratory. **MWL example**

d. The use of bentonite clay and organic drilling fluids in drilling the wells. These materials have known properties to mask the detection of LANL contaminants.

e. The use of the no-purge sampling system. EPA guidance requires purging the wells at least two casing volumes before sampling. In almost all cases, LANL is sampling the same stagnant water quarter after quarter.

Further, the National Academy of Sciences stated, "Many if not all of the wells drilled into the regional aquifer under the Hydrogeologic Workplan appear to be compromised in their ability to produce water samples that are representative of ambient groundwater for the purpose of monitoring." *Plans and Practices for Groundwater Protection at the LANL*, p. 49.

We must examine the lessons learned through the implementation of the Hydrogeologic Workplan. The schedule cannot be the sole driver. We need to ensure that the information and data that is collected can be relied upon to make scientifically based decisions about cleanup.

4. Part I: General Permit Conditions.

a. Section 1.4.1. Effect of this Permit on Interim Status Units. We object to the fact that there are interim status units at LANL. DOE states "[i]nterim status is the period during which the owner/operator of a TSDF is treated as having been issued a RCRA permit even though a final determination on the permit has not yet been made by the regulator." "Loss of Interim Status (LOIS) Under RCRA," U.S. Department of Energy, Office of Environmental Guidance, RCRA Information Brief, EH-231-0181/0992 (September 1992).

It is over 20 years since the interim status regulations went into effect. We reference a 2001 letter from the New Mexico Attorney General to NMED about the interim status sites at LANL. **Attachment 1, CCNS Lovejoy Letter on Loss of Permit July 12, 2001.doc.** When is NMED going to require the Permittees to obtain a permit for the "Interim Status Units Actively Managing Hazardous Waste," Table O-5? The sites listed in Table O-5 are open detonation sites. For the most part, these sites have no air, surface water, groundwater or soil monitoring and sampling being done to determine the levels of contamination. We request a compliance schedule be inserted into the Permit requiring the sites listed in Table O-5 to obtain a RCRA permit.

Table O-4 in the Draft Permit makes the mistake to describe the pits, trenches, shafts and impoundments that were used for disposal of hazardous and mixed wastes at MDAs G, H, and L at Technical Area 54 (TA-54) as "Permitted Units Undergoing Closure." The fact that the disposal activities at MDAs G, H, and L never received RCRA permits is described in a letter from Lindsay Lovejoy, Jr. of the New Mexico Attorney General (AGO) that was sent to James Bearzi, Chief of the NMED Hazardous Waste Bureau on July 12, 2001. Attachment 1. The pertinent part of the AGO letter follows:

> "Our concerns about the need for public participation particularly relate to the Hazardous and Solid Waste Amendments. ("HSWA") remediation process. We understand that the corrective action order will, inter alia, address HSWA remediation at Material Disposal Areas ("MDA") G, H, and L. We have pointed out to NMED that these MDAs were long ago required to stop receiving waste, have an approved closure plan and close, but this has not happened. MDAs G and L were required to close under 40 CFR §§ 265.112(d)(3) and 265.113(b) after NMED accepted LANL's withdrawal of the request for a permit for these areas in April 1985, terminating interim status under 40 CFR § 270.73(a). MDAs G, H, and

L were also required to close based on loss of interim status in November 1985, under 42 U.S.C. 3005(e)(2) and 40 CFR § 270.73(c). However, to date they have been neither closed or permitted" [emphasis supplied] (p. 1-2).

The NMED must retract Table O-4 from the Draft Permit because of the misrepresentation of the disposal sites at MDA G, H and L as "permitted units undergoing closure."

MDAs G, H, and L all disposed of hazardous and mixed waste after July 26, 1982, and therefore, are designated under RCRA as "regulated units" and must comply with the requirements of 40 CFR §§264.91 through 264.100 for purposes of detecting, characterizing and responding to releases to the regional aquifer. However, the requirements of §§264.91 through 264.100 have never been met for MDA G, MDA H or MDA L.

A recent LANL work plan, ***"Technical Area 54 Well Evaluation and Network Recommendations, Revision 1,"*** LA-UR-07-6436, October 2007, acknowledges that the requirements of §§264.91 through 264.100 have never been met for the three MDAs but still fails to implement the required network of monitoring wells at each of the MDAs. The NMED must retract the approval of the LANL report LA-UR-07-6436, October 2007.

In addition, the NMED has recently released for public comment the proposed remedy for closure of MDA H. The proposed remedy was based on the LANL Corrective Measures Study-Revision 1 (CMS-1) that was submitted to NMED on June 30, 2005. However, new findings during the 28-months from the CMS-1 report to the selection of the NMED remedy demonstrate that there is insufficient data to select the remedy for MDA H. The NMED has failed to perform work on a timely schedule and has also failed to recognize the many data gaps that prevent selection of the necessary remedy for MDA H to protect public health and the environment. The NMED must retract the selected remedy and order DOE to perform the necessary characterization activities at MDA H (and at MDAs G and L) including installation of the monitoring well network required by 40 CFR 264 Subpart F comprising §§ 264.90 through 264.101.

RCRA 40 CFR § 264.101 ***Corrective Action for Solid Waste Management Units*** requires DOE/LANL to install a network of monitoring wells in compliance with 40 CFR 264 Subpart F at each of the many legacy waste MDAs across the Laboratory facility. Presently, there are no monitoring wells at any of the MDAs that meet the requirements of Subpart F. In addition, § 264.101 requires the LANL draft permit to specify the corrective action at each legacy MDA and to contain schedules of compliance for such corrective action. From § 264.101:

(a) The owner or operator of a facility seeking a permit for the treatment, storage or disposal of hazardous waste must institute corrective action as

necessary to protect human health and the environment for all releases of hazardous waste or constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in such unit.

(b) Corrective action will be specified in the permit in accordance with this section and subpart S of this part. The permit will contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completing such corrective action.

The draft permit presents an unachievable schedule for closure of MDAs G, H, and L because of data gaps in the characterization activities of the LANL Consent Order. The pertinent part of the draft permit is below:

9.6 DISPOSAL UNITS AND UNITS TO BE CLOSED AS LANDFILLS
The disposal or landfill units, Material Disposal Areas (MDAs) G, H, and L, are no longer accepting hazardous waste and must undergo closure. The first phases of closure will be conducted through the corrective measures evaluation and implementation process outlined in Section VII of the March 1, 2005 Compliance Order on Consent (Order). The Permittees are required, in accordance with the Order, to submit to the Department for approval a Corrective Measures Evaluation Report (CME) for MDAs G, H (submitted), and L on September 12, 2008 and January 18, 2008, respectively. The Department will select remedies and issue a statement of basis for the selected remedies for each closed disposal or landfill unit in accordance with Section VII of the Order. The remedy selection is subject to public comment in accordance with 20.4.1.901 NMAC and as described in Section VII.D.7 of the Order. The selected remedies that will achieve closure of MDAs G, H, and L shall be protective of human health and the environment and attain the appropriate clean-up levels as specified in Permit Part 11 (*Corrective Action*).

The Consent Order was designed on a "Watershed Monitoring Approach" that was described in the final report of the National Academy of Sciences on the *LANL Groundwater Protection Practices* as follows:

"[T]here are areas where the Interim [LANL Groundwater Monitoring] Plan does not appear to follow good scientific practice. The most important of these is the focus on a watershed approach, where the monitoring plan for each watershed within LANL is developed and laid out individually in the Interim Plan. This structure, which is specified in the Consent Order, works quite well for monitoring surface base flows and alluvial groundwater that are confined to the canyons. However, it does not work well for the intermediate aquifers and even less for the regional aquifer" [emphasis added].

"As pointed out in the chromium workplan (LANL, 2006d) the source of high concentrations of chromium recently found in Mortandad Canyon does not appear to be within that canyon, but from the use of chromium in large amounts as a corrosion inhibitor at power plants in Sandia and Los Alamos Canyons, one or two canyons to the north. This finding suggests that a canyon-based approach [i.e., watershed approach] to development of monitoring plans for the intermediate and regional aquifers is not sound [emphasis added]."

- NMED, LANL, and DOE continue to use the watershed approach for monitoring contamination in the regional aquifer, despite the finding of the NAS that this approach is not scientifically sound. In fact, the watershed monitoring design in the NMED Consent Order prevents knowledge of groundwater contamination.

- The watershed monitoring approach is not in compliance with RCRA 40 CFR 264 Subpart F. Therefore, the NMED is not meeting the responsibility to enforce RCRA.

- The NMED watershed monitoring approach does not require monitoring wells to be located close to the large disposal sites on mesas including Area G, the active radioactive waste landfill and all of the sites where large volumes of legacy wastes are buried (the MDAs at TA-21, TA-49, TA-50, TA-54, etc.).

- There is an immediate need to revise the NMED Consent Order to remove the scientifically invalid "watershed approach" for monitoring groundwater.

b. Section 1.6.3. Transfer of Land Ownership. We support the requirement that the Permittees are required to submit a Class 3 permit modification request (PMR) to NMED "at least 180 days prior to the proposed transfer of ownership of any land which is part of the Facility as indicated in Figure 1-1." A Class 3 modification allows for transparency as well as an open public process.

We object to NMED allowing the Permittees to submit a Class 1 or 2 PMR for the transfer of land ownership. A Class 1 or 2 PMR do not require the same type of public notification requirements and processes. This language should be deleted from the draft permit.

We are aware of the problems the EPA is experiencing in terms of being properly notified about land transfers at LANL. Keeping track of the land transfers is an important issue and a Class 3 modification is one way to ensure that the process is open and public. We support the requirement for the Permittees for the Permittees to notify the State. 42 USC § 9620(h), §120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act.

c. **Section 1.6.6: Continuation of Expiring Permit.** NMED and the Permittees must work to ensure that a draft permit is available for public review and comment prior to the expiration of the ten (10) year term of the proposed permit, should NMED decide to issue a new permit. The existing permit was issued in November 8, 1989. Almost two decades have passed since the public has had the opportunity to participate in a permit renewal process for LANL. This must not reoccur. NMED and the Permittees must have a draft permit available for public review and comment prior to the expiration of the ten-year permit term. To do otherwise is irresponsible.

d. **Section 1.6.7: Permit Review by the Department.** We strongly urge NMED to conduct a review of the Permit five years after the effective date of the Permit, should NMED decide to issue a new Permit. As noted in the comment above, the public has had to wait almost two decades to participate in the Permit renewal process. Equity and justice requires a Permit review in five years after the effective date of the Permit. We suggest changing the language to: "The Department shall review...."

e. **Section 1.8: Definitions.** The definitions in the NMED/LANL Consent Order and the Permit must correspond to one another and be present in both. Otherwise, loopholes are created. For instance, essential definitions for *Area of Concern* and *Hazardous Waste* are different in the Consent Order and the draft Permit. This must be corrected in draft Permit. The current situation will cause general confusion and frustration for everyone involved. It is another example of inconsistent regulation by the Regulator.

We suggest the following definitions be included in the draft permit:

For "groundwater," use the definition in the NMED/LANL Consent Order:

"***Groundwater*** means interstitial water which occurs in saturated earth material and which is capable of entering a well in sufficient amounts to be utilized as a water supply."

For the following, please use the definitions found in RCRA 40 CFR § 260.10 Definitions:

"***Aquifer*** means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs."

"***Confined aquifer*** means an aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself; an aquifer containing confined ground water."

"***Discharge* or *hazardous waste discharge*** means the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water."

"***Disposal*** means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters."

"***Representative sample*** means a sample of a universe or whole (e.g., waste pile, lagoon, ground water) which can be expected to exhibit the average properties of the universe or whole."

"***Unsaturated zone* or *zone of aeration*** means the zone between the land surface and the water table."

"***Uppermost aquifer*** means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary."

f. Section 1.9.5: Duty to Mitigate. We support this provision and request that the Permittees prioritize addressing the hexavalent chromium plume in the regional aquifer at the location of regional well R-28. It has been four years, or 48 months, since LANL first discovered significantly elevated levels of chromium in the regional aquifer.

LANL has not taken "all reasonable steps to minimize the releases of hazardous wastes and hazardous constituents to the environment and [] carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment (40 CFR § 270.30(d))." Since September 2005, the levels have remained around 400 parts per billion (ppb), or eight times the New Mexico Water Quality Act standard. How long does the public have to wait for LANL to take all reasonable steps to protect regional drinking water supplies? The most productive Los Alamos County drinking water well, PM-3, is about 4,000 feet from well R-28.

g. Section 1.9.6: Proper Operation and Maintenance. We support the language that "adequate funding" is part of proper operation and maintenance. So many times these activities are compromised because of the lack of adequate funding - or lack of adequate prioritization for proper operation and maintenance. We encourage NMED to ensure that proper operation and maintenance is done at LANL.

h. Section 1.9.9.1: Representative Sampling. Please see discussion about problems with the regional wells that prevent the collection of reliable and representative samples and suggested changes to the draft permit below.

i. **Section 1.9.12: Twenty-Four Hour and Subsequent Reporting.** Please insert language in the text to reflect the fact that the Permittees are required to report with 24-hours.

j. **Section 1.9.12.1: Oral Report.** Doesn't NMED have a person on 24/7 call for noncompliance or incident or spill reporting? If so, please insert that number in this section.

k. **Section 1.9.12.1: Oral Report and Section 1.9.12.2: Written Report.** Both of these sections should include an assessment of actual or potential hazards to the environment and human health *inside the Facility* boundaries as well as outside the Facility boundaries.

l. **Section 1.9.13: Other Noncompliance.** This section must include a provision that the noncompliance must be included in the cover letter used to submit the monitoring reports. Recall that the chromium in regional well R-28 was first reported in a table of a monitoring report. As a lessons learned, the permit must require the Permittees to proactively report noncompliance in the cover letter to NMED submitting the monitoring report.

m. **Section 1.12. Community Relations Plan. E-Mail Notifications.** CCNS and Gilkeson support inclusion of an electronic mailing list in the draft LANL permit, as was included in the WIPP Permit, Module I.H. That provision was agreed to by DOE, numerous organizations and NMED and should be included in both the LANL and Sandia National Laboratories (SNL) permits. Both SNL and LANL should provide a link on their home pages whereby members of the public may review the actions requiring e-mail notification. Specific requirements needed in the LANL permit include the notice requirement to inform those on the e-mail notification list, such as in a modified Dispute Resolution provision.

Community Relations Plan. We are concerned about the requirements for establishing and implementing the Community Relations Plan as detailed in the draft permit. We support consultation with the Pueblos, but it should include all 19 Pueblos in New Mexico who have connections with the Jemez Mountains and the Pajarito Plateau. The Plan must address environmental justice concerns as required by Governor Richardson's Executive Order, as well as DOE documents.

Further, LANL must be required to consult with public interest and environmental groups, as well as the Northern New Mexico Citizens' Advisory Board to establish and implement the Plan. Since the contract changed at LANL in June 2006, the community outreach has been restrictive. It is more difficult to obtain information

from LANL as a result. These issues should be addressed in the Permit, as well as the Consent Order.

The Permittees must be required to distribute copies of the Community Relations Plan to interested members of the public, as well as any updates.

n. Section 1.13. Dispute Resolution. We are surprised that the Dispute Resolution provisions in the draft permit do not track with those found in the Consent Order §III.1, nor with those in the WIPP Permit, Module I.L, specifically the requirements for tiered negotiations, time requirements and public electronic mail notification process. We are concerned about the inconsistencies across enforceable documents for the Department of Energy (DOE) facilities in New Mexico regulated by the NMED, of which the differences in the dispute resolutions provisions are a prime example. We suggest that the Dispute Resolution provisions in the draft permit tract with the Consent Order (tiered negotiations with time restrictions) and the WIPP Permit (tiered negotiations with time restrictions and electronic mail notification process for the public).

5. Part 2: General Facility Conditions.

a. Section 2.1: Design, Construction, Maintenance, and Operation of the Facility. It is curious that NMED requires the Permittees to "design, construct, maintain, and operate the Facility to minimize the possibility of [] explosion," but does not include the open detonation sites in the permit. As noted in the 60-day Clean Water Act notice, the explosion of hazardous materials at the detonation sites is impacting surface water.

b. Section 2.10. Preparedness and Prevention. We are concerned about whether the Permittees will be able to meet the requirements in this Section. We reference **Attachment 2,** the February 2007 DOE Office of Health, Safety and Security, and the Office of Emergency Management Oversight, Office of Independent Oversight, Office of Health, Safety and Security, and Office of the Secretary of Energy report, entitled "Independent Oversight Inspection of Emergency Management at the Los Alamos Site Office and Los Alamos National Laboratory." The report is no longer available on the DOE website, unless you have a password. We will make a copy and deliver it for insertion into the Administrative Record.

The inspection "focused on a detailed assessment of six key emergency management programmatic elements, as well as the performance of key emergency response decision-makers and support functions during performance tests." Id., Section 4.0 "Ratings," p. 8. The inspectors assigned ratings for the individual program elements and found that the essential hazard surveys and emergency planning hazards assessment showed "significant weakness." They found that the other elements needed improvement. These elements [in plain text] are:

Emergency Planning
Program Plans and Procedures
Emergency Preparedness
Training, Drill, and Exercise Program
Emergency Public Information
Emergency Response
LANL Incident Command Team and EOC Decision-Making
Readiness Assurance
NNSA Line Program Management
LANL Feedback and Improvement

We quote from the "Introduction," which expresses some of our concerns about the capacity of the Permittees to comply with the Permit requirements:

> "The purpose of this Independent Oversight inspection was to assess the effectiveness of emergency management programs at LANL as implemented by LANS under LASO line management oversight. The scope of the emergency management review at LANL considered the results of the April 2002 Independent Oversight inspection, which identified effective systems in several aspects of LANL's emergency management program, including the emergency preparedness program at the Chemical and Metallurgical Research facility, the conservative approach to chemical screening thresholds, and the strong interfaces with offsite responders and local emergency management committees. However, LANL had not effectively implemented the necessary program elements to ensure timely and accurate emergency response decisions and actions, particularly in the areas of procedures, training, drills, management expectations, notification systems, and emergency public information (EPI). Furthermore, LASO had not formally assigned responsibilities and dedicated resources to monitor the effectiveness of the LANL emergency management program and to fulfill site office emergency planning and response requirements. Finally, LASO and LANL feedback and improvement programs were not fully effective in ensuring that emergency management process and performance deficiencies were identified, resolved, and corrected in a timely manner." Id., p. 1-2.

Required Revision of "Determination of Background" (page 130 in Draft Permit)

Section 11.10.6. Determination of Background.

The Permittees shall determine an appropriate background data set for inorganic constituents at the site. The Permittees shall determine whether one or more background data sets are appropriate depending on soil types and geology at the site. Background concentrations for groundwater shall be collected from upgradient wells [see below for required change to this sentence]. The background data set shall be

representative of natural conditions unaffected by site activities and shall be statistically defensible. A sufficient number of background samples shall be collected for use in the risk assessment, including conducting site attribution analyses and comparison of data sets.

The required revision follows: "Background concentrations for groundwater shall be collected from single-screen wells that are at appropriate locations upgradient of each of the LANL MDAs and SWMUS as defined in RCRA 40 CFR §264.94 and as described in Section 5.1.3, pages 5-10 to 5-12 in the "*RCRA GROUND-WATER MONITORING: DRAFT TECHNICAL GUIDANCE*" OFFICE OF SOLID WASTE U.S. ENVIRONMENTAL PROTECTION AGENCY 401 M STREET, S.W. WASHINGTON, D.C. 20460, NOVEMBER 1992. The background wells shall be drilled with drilling methods that do not invade the screened intervals with any organic drilling additives or bentonite clay drilling muds. The well screens shall be of nonmetallic materials that will not corrode. Grade 304 and 310 stainless steel well screens are not acceptable for installation in background water quality monitoring wells."

Excerpt from Draft Permit Section 11.11.1 Types of Monitoring Wells

> "Two types of groundwater monitoring wells may be installed at the Facility: single completion (containing one screened interval) and multiple screened wells." p. 132.

The installation of multiple-screened wells in perched zones of saturation and into the regional aquifer at LANL is unacceptable because of the inability of this design to produce reliable and representative water samples. The only type of groundwater monitoring well that may be installed at the Facility is the single completion with one screened interval. A specific recommendation in the National Academy of Sciences Report on the *LANL Groundwater Protection Practices* is for LANL to install single-screen wells:

> — *" LANL should design and install new monitoring wells with the following attributes:*
> - *One screened interval that targets a single saturated zone, and*
> - *A carefully planned design (length and depth) of the well screen, which is confirmed with information collected in the drilling process."* (p.98)

"11.11.2.3 Water Rotary and Mud Rotary"

In the NMED Draft Permit, Section **"11.11.2.3 Water Rotary and Mud Rotary"** drilling methods must be completely struck from the Draft Permit. These drilling methods were allowed by NMED for constructing characterization wells in the LANL Hydrogeologic Workplan. However, the historic record shows that these drilling

methods allowed water-based organic drilling fluids and -foams and bentonite clay drilling muds to invade greater than 80 screened intervals in the LANL characterization wells. The organic additives and bentonite clay muds formed a new mineralogy in the screened intervals of all of the wells that have prevented the wells from producing water samples that are reliable and representative for the LANL contaminants.

– A specific recommendation in the National Academy of Sciences Report on the LANL Groundwater Protection Practices is for LANL to use drilling methods that prevent the invasion of any muds or organic additives into the screened intervals of the characterization or monitoring wells:

> – *" LANL should design and install new monitoring wells with the following attributes:*
> • *A borehole drilled through the monitoring zone without the introduction of drilling muds or additives (i.e., use air or water)* (p.98).

The Environmental Protection Agency Kerr Laboratory wrote a report titled "*Los Alamos National Laboratory, Los Alamos, New Mexico (05RC06-001) Impacts of Hydrogeologic Characterization Well Construction Practices on the LANL Well Construction Practices*" that was released on February 10, 2006: The EPA report identified the need to prevent bentonite clay or water-based organic additives from invading the screened intervals of the LANL monitoring wells.

"1. Strive to drill boreholes using no bentonite or organic additives within screened intervals. Additives may be used in intervals above the target monitoring zone if telescoping casing constructions are used and the hole is adequately cleaned before drilling the final footage within the interval to be screened. Targeting of monitoring intervals prior to drilling should be possible at locations where data from the existing characterization wells are available" (p.15).

"4. At locations determined to be critical to the detection monitoring program, consider replacement of wells that were drilled using bentonite or that exhibit impacts due to organic additives with wells installed without additives in the screened zones, if needed to meet the DQOs for that monitoring location" (p.15).

"With respect to screens where bentonite-based additives were used, it is possible that even trace amounts of residual bentonite that remain following development may render ground-water samples non-representative for highly sorbing constituents. This situation would be difficult to accurately characterize. Therefore, the quality of samples for constituents such as isotopes of americium, cerium, plutonium, and radium obtained from these screens will likely remain uncertain even after re-development" (p.7).

The drilling history at the Los Alamos National Laboratory has established that the only acceptable drilling method is air rotary casing advance using telescoped drill casings. Drilling additives may be used for advancing the drill casing in the unsaturated zone. It is crucial to drill only with air for advancing the drill casing into perched zones of saturation where well screens will be installed and for advancing drill casing into the regional aquifer.

Issues about Section 11.11.2.3 Water Rotary and Mud Rotary Drilling Methods.

Section 11.11.2.3 Water Rotary and Mud Rotary is pasted below along with suggested changes required for this section in the draft permit:

The water and mud rotary drilling methods consist of rotary drilling techniques where water or drilling mud is used as the circulating fluid. In both methods, the circulating fluid is pumped down through the drill pipe and is returned back up the borehole through the annular space. The circulating fluid stabilizes the borehole, cools the drill bit, and carries the drill cuttings up to the surface. While the water and mud rotary drilling techniques are rapid and effective drilling methods, the recognition of water-bearing zones is hampered by the addition of water into the system.

Mud rotary drilling is similar to water rotary drilling with the exception that mud additives are added to the water to change the properties (e.g., density, viscosity, yield point, gel strength, fluid-loss-control effectiveness, and lubricity) of the circulating fluid. Drilling muds provide greater borehole stabilization than water alone. There are several types of mud presently available, including bentonite, barium sulfate, organic polymers, cellulose polymers, and polyacrylamides. ~~While drilling muds enhance the stability of the borehole and allow for drilling in formations not appropriate to other methods, they~~ **Bentonite clay drilling muds, organic fluids, and organic foams can adversely affect the hydrologic** properties and geochemistry of the aquifer. For example, drilling fluid invasion and the buildup of borehole filter cake may reduce the effective porosity of the aquifer in the vicinity of the borehole. In addition, bentonite drilling muds may affect the pH of groundwater and organic polymer drilling muds have been observed to facilitate bacterial growth, which reduces the reliability of sampling results. **Therefore, LANL shall only use drilling methods that prevent the invasion of any bentonite clay drilling muds, organic fluids and organic foams into the screened interval of monitoring wells installed into perched zones of saturation and into the regional aquifer. The only drilling fluid that shall be allowed to invade screened intervals in the zones where well screens are installed is air.** ~~If polymer emulsions are to be used in the drilling program at the Facility, polymer dispersion agents shall be used at the completion of the drilling program to remove the polymers from the boreholes. For example, if EZ Mud® is used as a drilling additive, a dispersant (e.g., BARAFOS® or five percent sodium hypochlorite) shall be used to disperse and chemically breakdown the polymer prior to developing and sampling the well. If drilling fluids are used as part of well installation, the Permittees must demonstrate that all data acquired from the well is representative of existing subsurface conditions using methods approved by the Department. The Department may require additional sampling and testing periodically to ensure that the data collected is not affected by residual drilling fluids.~~

Section 11.11.2.3 describes the conventional circulation rotary drilling methods known as the "mud-rotary method" that were used for the installation of many characterization wells at LANL over the past ten years. None of the characterization wells installed with the mud rotary method or with the fluid-assisted air rotary method are usable for contaminant detection monitoring wells or for long-term monitoring wells because the drilling methods invaded all of the screened intervals with bentonite clay drilling muds

and with organic drilling additives that have well-known properties to mask the detection of many LANL contaminants of concern.

There are two examples of where drilling equipment was lost in boreholes because the organic or bentonite clay drilling muds failed to stabilize the boreholes from collapse. Both boreholes were plugged and abandoned and new boreholes were drilled for installation of the characterization wells. The two wells are the following:

1. Well R-4 Kleinfelder Project No. 37151/7.12, February 2005.
2. Well R-8 LANL Report LA-UR-03-1162

There are many instances of where the mud-rotary drilling method and the fluid-assisted air rotary drilling method were unable to stabilize the open boreholes and it was necessary to use the air-rotary casing advance drilling method to stabilize the borehole and install the characterization well. Some examples are the following LANL characterization wells:

1. Well R-5 Kleinfelder Report Project No. 37151, April 2005
2. Well R-6 LANL Report LA-UR-03-1600, June 2006
3. Well R-8 LANL Report LA-UR-03-1162, June 1, 2003
4. Well R-13 LANL Report LA-UR-03-1373, June, 2003
5. Well R-14 LANL Report LA-UR-03-1664, June 1, 2003
6. Well R-16 LANL Report LA-UR-03-1841, June 1, 2003
7. Well R-22 LANL Report LA-13893-MS, February 1, 2002
8. Well R-23 LANL Report LA-13910-MS, March 1, 2002
9. Well R-26 Kleinfelder report, (Kleinfelder 2005, 92033)
10. Well R-31 LANL Report LA-13910-MS, March, 2002.]

Further, the Final National Academy of Sciences Final Report on the *Plans and Practices For Groundwater Protection At The Los Alamos National Laboratory* (Summer, 2007) made the following recommendation on page 60-61:

Recommendation: *LANL should design and install new monitoring wells with the following attributes:*

- *A borehole drilled through the monitoring zone without the introduction of drilling muds or additives (i.e., use air or water),*
- *One screened interval that targets a single saturated zone, and*
- *A carefully planned design (length and depth) of the well screen, which is confirmed with information collected in the drilling process.*

The drilling method that meets the recommendation of the National Academy of Sciences is air-rotary reverse circulation underreamer casing advance using only air as a drilling fluid for advancing the drill casing into perched zones of saturation and into the regional aquifer. The draft permit shall describe that this is the only drilling method that shall be used for drilling into the saturated zones where the well screens will be installed. Too much time, money and resources have been used to drill wells that are unusable, except for water levels.

An additional important reason for use of air-rotary reverse circulation underreamer casing advance using only air as a drilling fluid for advancing the drill casing into perched zones of saturation and into the regional aquifer is that it produces groundwater from the zones of saturation that is not invaded and contaminated with the water-based drilling fluids. Collecting the most representative water samples for measurement of contaminants of concern during drilling is essential for the most accurate knowledge on where screened intervals in monitoring wells shall be installed.

In order to protect regional drinking water supplies, the use of the mud rotary drilling method must be struck from the Consent Order as well.

Issues about Section 11.11.3 Well Construction/Completion Methods

The NMED Draft Permit **Section 11.11.3 Well Construction/Completion Methods** must be revised to not allow the use of stainless steel screens in the LANL monitoring wells.

The pertinent parts of Section 11.11.3 Well Construction/Completion Methods with the required changes are pasted below:

Generally, if the monitoring program requires the analysis of organic constituents, ~~stainless steel or~~ fluoropolymer materials **and other suitable nonmetallic materials** should be used.

Well screen and casing materials acceptable for the construction of RCRA monitoring wells include ~~stainless steel (304 or 316),~~ rigid PVC (meeting American National Standards Institute/National Sanitation Foundation Standard 14), and fluoropolymer materials (polytetrafluoroethylene, fluorinated ethylene propylene, and polyvinylidene).

Stainless steel shall not be used for the well screens in the LANL monitoring wells because the screens will corrode and the incrustations formed by the corrosion have strong properties to prevent the stainless steel screened wells from producing reliable and representative water samples for many of the LANL contaminants of concern.

The LANL *Well Screen Analysis Report-Revision 2* (WSAR-2) LA-UR-07-2852 May 2007) identifies the possible onset of corrosion in 18 of the 80 stainless steel well screens studied and that 5 of the screens show indications of possible stainless-steel corrosion

that is masking the detection of the LANL contaminants. The pertinent text in the WSAR-2 is pasted below:

> "Test outcomes are tabulated in Table C-7, in the far right-hand column labeled "Category F, Metal Corrosion." In order for the second set of tests to be applicable, the sample must first show that it meets at least one of the qualifying conditions (i.e., it must fail at least one of these tests) (Figure 4-4). Among the most recent samples from each screen, 18 of the 80 screens meet at least one qualifying condition. Of those 18 screens, five show indications of possible stainless-steel corrosion:
>
> • CdV-16-2(i)r—high iron ratio
> • R-19 Screen 7—high total/dissolved iron ratio and high total/dissolved chromium ratio
> • R-22 Screen 1—high total/dissolved chromium ratio
> • R-25 Screen 1—high total/dissolved iron ratio, high total/dissolved chromium ratio
> • R-25 Screen 2—high total/dissolved chromium ratio, high dissolved nickel concentration"

High levels of chromium and nickel were measured in 1995 in well R-25 screens #1 and #2. LANL made the claim to NMED that the high levels were because of corrosion of the stainless steel well screens.

In a April 5, 2007 letter, NMED ordered LANL to stop collecting water samples from screens #1 and #2 in well R-25 and to install new monitoring wells to collect reliable and representative water samples.

Corrosion of stainless steel well screens has occurred for all of the monitoring wells with stainless steel screens that are installed at the Sandia National Laboratories Mixed Waste Landfill (MWL). In letters dated March 23 and July 2 of 2007, NMED ordered Sandia to replace the monitoring wells with corroded stainless steel screens at the MWL with new monitoring wells that have nonmetallic screens.

The water quality data show that the onset of corrosion in the Sandia MWL wells began within five years after the wells were installed. It is reasonable to expect that corrosion will occur in the stainless steel screens in the LANL characterization wells on the same schedule.

Indeed, corrosion may already mask the detection of many LANL contaminants of concern in the water samples produced from the greater than 80 stainless steel screens in the network of LANL characterization wells.

In addition, the LANL water quality data are proof that corrosion has prevented the old LANL test wells from producing reliable and representative water samples for a period longer than the last forty to fifty years. Another feature that has prevented all of the old test wells from ever producing reliable and representative water samples is the very long length of the well screens. Nevertheless, the old test wells are included in the Interim Site-Wide Long-Term Monitoring Plan as producing reliable and representative water samples for monitoring releases from the large legacy waste disposal site at TA-49. NMED must order LANL to stop collecting water samples from the old test wells. NMED must order LANL to plug and abandon the old test wells and to install new monitoring wells for the monitoring requirements that the old test wells are presented as providing.

The LANL *Well Screen Analysis Report* is not credible to identify the effects of the early stages of corrosion to prevent the LANL characterization wells from producing reliable and representative water samples. Laboratory research by the Cold Regions Research and Engineering Laboratory (Hewitt, 1994 *Dynamic Study of Common Well Screen Materials*, Groundwater Monitoring Review-Winter 1994) has proven that corrosion of stainless steel well screens occurs after a period of only 130 days and that the corrosion produced incrustations of iron oxide deposits on the screens with strong properties to mask the detection of the trace metals lead and cadmium. This research shows the concern that all of the LANL characterization wells are not reliable for detection of many hazardous waste and radionuclide contaminants of concern from the LANL wastes.

In Section **11.11.2 Drilling Methods,** the draft permit contains a requirement that is also in the NMED Consent Order:

> "The design and construction of groundwater monitoring wells shall comply with the guidelines established in various EPA RCRA guidance, including, but not limited to: U.S. EPA, RCRA Groundwater Monitoring: Draft Technical Guidance, EPA/530-R-93-15 001, November, 1992."

On page 6-25, this EPA document recommends to not use stainless steel screens when the contaminants of concern include metals and organics. Many of the LANL hazardous waste contaminants are metals and organics. In addition, the LANL radionuclide contaminants including the isotopes of plutonium, americium, neptunium, cerium, cesium, cobalt, strontium and uranium are metals.

On page 6-32, this EPA document lists the following disadvantages for stainless steel well screens in monitoring wells:

> Disadvantages of stainless steel well casing and screen materials:

· May corrode under some geochemical and microbiological conditions;
· May sorb cations and anions;
· May contribute metal ions (iron, chromium, nickel, manganese) to groundwater samples;
· High weight per unit length; and
· Type 304 and Type 316 stainless steel are unsuitable for use when monitoring for inorganic constituents.

The properties of stainless steel screens to corrode and form incrustations to mask the detection of many LANL contaminants of concern was known from research and EPA regulatory documents long before the stainless steel screens were installed in the large network of LANL characterization wells. NMED must order LANL to stop collecting water samples from stainless steel screened wells where there is a concern to detect organic or metal contaminants. NMED must order LANL to install a network of monitoring wells across and away from the laboratory facility with nonmetallic well screens.

Issues With Section 11.3.1.2. Compliance Monitoring

Section 11.3.1.2. Compliance Monitoring is pasted below.

11.3.1.2 Compliance Monitoring
The Permittees shall conduct compliance monitoring in accordance with the requirements of 40 CFR § 264.99, which is incorporated herein by reference, to monitor the progress of cleanup of contaminants in groundwater. The Permittees shall coordinate such monitoring with the monitoring conducted under the Interim Facility Wide Groundwater Monitoring Plan and any Department-approved watershed-specific Long-term Groundwater Monitoring Plans under the Order.

The draft permit is correct to require LANL/DOE to "conduct compliance monitoring in accordance with the requirements of 40 CFR § 264.99." But the draft permit fails to address the fact that the contamination detected in the groundwater at LANL characterization well R-22 requires the installation of discrete networks of monitoring wells immediately at and away from each of the RCRA regulated units, including MDAs G, H, and L at TA-54 to meet compliance with 40 CFR § 264.99.

The purpose for well R-22 to monitor groundwater contamination from the three regulated units at TA-54 is described in the LANL R-22 Well Completion Report (LA-13893-MS, February 2002):

> "R-22 was funded and installed by the Laboratory's Environmental Restoration (ER) Project. The well was designed primarily to provide water-quality and water-level data for potential intermediate-depth perched zones and for the regional aquifer downgradient of the waste disposal facility at TA-54" (p. iX).

Table 1 lists the many radionuclide and hazardous waste contaminants produced over many quarters in the water samples produced from well R-22. The nature and repeated measurement of the contamination meets the finding under § 264.98 of "statistically significant evidence of contamination" and requires implementation of the RCRA Compliance Monitoring Program of § 264.99.

NMED has approved the LANL strategy to install the network of monitoring wells at TA-54 to meet compliance with RCRA 40 CFR § 264.90-99, Subpart F as described in LANL report *TA-54 Evaluation and Network Recommendations, Revision 1* (LA-UR-07-6436, October 2007). However, the proposed network of monitoring wells in the LANL report fails to meet the requirements of RCRA Subpart F for any of the three regulated units, MDA G, MDA H and MDA L.

NMED must retract the approval of LANL Report LA-UR-07-6436, October 2007 and order DOE to install the monitoring well program at TA-54 that meets the requirements of RCRA 40 CFR § 264 Subparts F and G.

Further, the following statement in Section 11.3.12 must be struck from the draft permit.

> "The Permittees shall coordinate such monitoring with the monitoring conducted under the Interim Facility Wide Groundwater Monitoring Plan and any Department-approved watershed-specific Long-term Groundwater Monitoring Plans under the Order."

This statement must be struck because of the following:

1. The LANL Interim Facility Wide Groundwater Monitoring Plan relies on the assessment in the LANL *Well Screen Analysis Report- Revision 2* (WSAR-2) to identify the LANL characterization wells and the old LANL test wells that produce reliable and representative water samples. However, reports by the National Academy of Sciences (NAS) and the EPA Kerr Laboratory presented findings that the well assessment scheme in the LANL WSAR-2 was not credible.

- See National Academy of Sciences Final Report on the *Plans and Practices For Groundwater Protection At The Los Alamos National Laboratory* (Summer, 2007).

- See EPA Kerr Laboratory Report, February 16, 2006. "Los Alamos National Laboratory, Los Alamos, New Mexico (05RC06-001), Review of LANL Well Screen Analysis Report, (LA-UR-05-8615)," Environmental Protection Agency memorandum to R. Mayer (EPA/Region 6) from R. Ford (EPA/NRMRL) and S.D. Acree (EPA/NRMRL) Office of Research and Development, Ada, Oklahoma.

2. The NMED-approved Interim Facility-Wide Groundwater Monitoring Plan and the NMED-approved watershed-specific Long-term Groundwater Monitoring Plan

were found by the National Academy of Sciences in the 2007 Final Report referenced above to "not work well for the intermediate aquifers and even less for the regional aquifer." A section in the NAS Final Report was titled "Evaluation of the Interim Groundwater Monitoring Plan." Pertinent findings of the NAS are pasted below.

"However, there are areas where the Interim Plan does not appear to follow good scientific practice. The most important of these is the focus on a watershed approach, where the monitoring plan for each watershed within LANL is developed and laid out individually in the Interim Plan. This structure, which is specified in the Consent Order, works quite well for monitoring surface base flows and alluvial groundwater that are confined to the canyons. However, it does not work well for the intermediate aquifers and even less for the regional aquifer. For example, in the discussion of the monitoring plan for Mortandad Canyon in Part 4 of the Interim Plan, the potential contaminant sources that are discussed are only those that fall within the Mortandad Canyon watershed" (p. 43).

"As pointed out in the chromium workplan[7] (LANL, 2006d) the source of high concentrations of chromium recently found in Mortandad Canyon does not appear to be within that canyon, but from the use of chromium in large amounts as a corrosion inhibitor at power plants in Sandia and Los Alamos Canyons, one or two canyons to the north. This finding suggests that a canyon-based approach to development of monitoring plans for the intermediate and regional aquifers is not sound" (p. 43-44).

"Even without a quantitative analysis of the sample locations in the intermediate and regional aquifers, the committee noted several modifications that could be made to the current monitoring network. Given the tendency for regional aquifer monitoring wells to be located in canyon bottoms, large portions of the intermediate and regional aquifers are not monitored given the current monitoring plans and approach. This makes it far more likely that the current monitoring plan will not provide early identification and response to potential environmental impacts from the laboratory. Although the committee understands that there are strong economic and drilling incentives to locate regional monitoring wells below the canyons, and a number of additional monitoring locations could be placed in canyon bottoms that would contribute significantly to the existing network, eventually a way must be found to increase the area of the intermediate and regional aquifers that are monitored. This may require locating some deep monitoring wells below mesa tops, and/or the drilling of slant holes from canyon bottoms to monitor the regional aquifer below the mesas" (p. 44).

"In looking at the regional monitoring network, the committee found that the southern portion of LANL is one area of the regional aquifer that is currently very sparsely monitored. . . . Another area that appears to be undersampled is the Pueblo de San Ildefonso to the east of LANL, which is generally downgradient from the site. Plans to install monitoring wells on Pueblo lands under the Memorandum of Understanding[8] described in Section 3 of LANL (2006a) are a step in the right

direction. Additional monitoring to ensure early detection of contaminant plumes beneath these Pueblo lands will likely be required" (p.44).

"There were other parts of the Interim Plan where the committee deemed that additional information is needed. One suggestion would be to broaden the overview of geology and hydrogeology in the main text of the Interim Plan" (p. 44).

"There is little to no information provided in Appendix A of the Interim Plan, or in the body of the plan, on pathways by which the contaminants are moving, which is a critical part of a conceptual model" (p.45).

In addition, both the NMED-approved Interim Facility-Wide Groundwater Monitoring Plan and the NMED-approved watershed-specific Long-term Groundwater Monitoring Plan fail to meet the requirements of 40 CFR § 264 Subpart F for monitoring wells located at the "point of compliance" (§ 264.95), the Detection Monitoring Program (§ 264.98) and the Compliance Monitoring Program (§ 264.99).

The record is proof that NMED must retract the approval of the LANL Interim Facility Wide Groundwater Monitoring Plan and the NMED watershed-specific Long-term Groundwater Monitoring Plans under the Consent Order.

Furthermore, in order to correct the many mistakes in the NMED LANL Order on Consent, the Consent Order must be incorporated into the RCRA permit and the RCRA permit must incorporate the Consent Order.

Table 1
Contaminants listed in the LANL Well R-22 Geochemistry Report
LA-13986-MS, 2002

- tritium (109 picocuries per liter (pCi/L) at the water table of the regional aquifer)
- technetium-99 (4.3 and 4.9 pCi/L)
- * pentachlorophenol (6.2 parts per billion (ppb))
- * chloroform (0.94 ppb)
- * phenol (19 and 32 ppb)
- * 4-methylphenol (44 to 210 ppb)
- * 2-butanone (6.9 to 8.9 ppb)
- * diethylphthalate (1.3 ppb) [5]

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[5] * The six hazardous waste contaminants with asterisks in the above list are highly mobile in groundwater and all are commonly found in groundwater beneath hazardous waste dumps. There are large amounts of these contaminants in the mixed wastes buried in MDA G. The measurement of these contaminants in the water samples produced from well R-22 is direct evidence of groundwater contamination below MDA G. The nature and extent of the contamination is not known but must be investigated.

– benz(a)pyrene (0.24 ppb)
– benzoic acid (3 to 12.5 ppb)
– butyl benzyl phthalate (9.8 ppb)
– toluene (0.2 to 0.76 ppb)
– methylene chloride (0.62 and 2.2 ppb)
– bis(2-ethylhexyl)phthalate (1.0 and 3.9 ppb)

– Several substituted benzene compounds including:
– isopropylbenzene (0.16 to 0.54 ppb), and
– 1,4-dichlorobenzene (0.16 to 0.23 ppb).

Tritium and technetium-99 are radionuclide contaminants that are highly mobile. Large amounts of both contaminants are buried in open pits and shafts at MDA G. The two contaminants are direct evidence of groundwater contamination from MDA G.

A LANL report – LA-UR-04-6777, September 2004 recognizes the contamination detected in the water samples produced from well R-22 as follows:

> "Thirty-one volatile and semi-volatile organic compounds have also been detected in water from well R-22. Only two of these, pentachlorophenol (1 detection, 6.2 ppb, MCL = 1 ppb)[6] and benzo(a)pyrene (2 detections, 0.24 ppb, MCL = 0.2 ppb) were present at concentrations above the MCL. Monitoring for organic compounds at well R-22 will continue" [Emphasis Added.]

The Permittees have known about the contamination in well R-22 for six years and NMED has not required compliance with Subpart F requirements, "Releases from Solid Waste Management Units," 40 CFR §§ 264.90, *et seq.* In order to protect regional drinking water supplies, NMED must require *strict* compliance with Subpart F. 40 CFR §§ 264.90 through 101.

LANL acknowledges the need for strict compliance with Subpart F in the *TA-54 Evaluation and Network Recommendations, Revision 1*, October 2007:

> 2. Establish a groundwater-monitoring network that meets the requirements for "detection monitoring" and subsequent "compliance monitoring" at permitted units at TA-54. **The following requirements from 40 CFR 264.90-.99, Subpart F apply to permitted units or regulated units that received waste after July 26, 1982.** The regulations apply throughout the active life of the units and the closure and post-closure period if the units are not "clean-closed" under RCRA. The groundwater-monitoring network and facility process must be able to detect, evaluate, and respond to releases of hazardous waste or hazardous waste constituents into the uppermost aquifer. Detection monitoring is required to establish that a release has occurred. It is assumed that because of the significant depth to groundwater beneath TA-54, vadose-zone monitoring will be a key component of the overall monitoring program in support of both CMEs and the RCRA Part B permit." [Emphasis Added.] p. 6.

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[6] MCL means Maximum Contaminant Level allowed in the EPA Drinking Water Standards.

Further, LANL acknowledges that MDA G, MDA H and MDA L are regulated units under RCRA.

Section 11.11.4 Well Development

Required changes in **Section 11.11.4 Well Development** on page 141.

> A new monitoring well shall be developed until the column of water in the well is free of visible sediment, and the pH, temperature, turbidity, and specific conductivity have stabilized. In most cases, the above requirements can be satisfied. However, in some cases, the pH, temperature, and specific conductivity may stabilize but the water remains turbid. In this case, the well may still contain well construction materials, such as drilling mud in the form of a mud cake or formation soils that have not been washed out of the borehole. Thick drilling mud cannot be flushed out of a borehole with one or two well volumes of flushing [emphasis supplied - see comment 1 below]. Instead, continuous flushing over a period of several days may be necessary to complete the well development. If the well is pumped dry, the water level shall be allowed to sufficiently recover before the next development period is initiated. [emphasis supplied - see comment 2 below].

Comment 1. The underlined sentences about development to remove drilling muds shall be struck because under no terms shall drilling muds or organic drilling fluids or -foams be allowed to invade the screened intervals. In addition, the historical record shows that on several occasions for the LANL characterization wells, mistakes in well construction invaded the screened intervals with the bentonite clay/grout backfill materials. The well development methods are not capable of cleaning these materials from the screened intervals. Therefore, if mistakes cause invasion of screened intervals with grout materials, then the well shall be plugged and abandoned and replaced with a new well.

Comment 2. A primary requirement is the installation of well screens in permeable zones in the regional aquifer. Well development shall monitor water levels to prevent pumping the wells dry during well development because too aggressive well development practices will damage the hydraulic properties of the screened intervals. Where it is necessary to install well screens in poorly productive geologic formations, well development shall be performed with care to avoid pumping the wells to dryness. The need to preserve and enhance the hydraulic performance of wells is reason to prevent any bentonite clay drilling muds or organic fluids or -foams from invading the screened intervals because of the properties of these additives to plug and reduce the *in situ* saturated hydraulic conductivity of the screened interval.

GREAT UNCERTAINTY IN SEISMIC HAZARD AT THE LOS ALAMOS NATIONAL LABORATORY

Major seismic issues are outstanding at the Los Alamos National Laboratory and the Defense Nuclear Facilities Safety Board issued a report on December 22, 2006 that increased the energy released from a seismic event by about 50 %. There is great uncertainty about the seismic hazard because of the failure of DOE to do the necessary studies.

This great uncertainty is described in the 2007 Final Report - *Update Of The Probabilistic Seismic Hazard Analysis And Development of Seismic Design Ground Motions At The Los Alamos National Laboratory* (PSHA) (URS, May 25, 2007).

- The PSHA identifed the need to recalculate the seizmic hazard using the latest versions of the NGA ground motion attenuation relationshipsl The new calculations have not been performed.
- There is new awareness of the importance of the Pajarito fault system to the LANL seismic hazard but important field studies for detailed mapping and displacement measurements along this fault have not been performed. The field studies are essential to understand seismic danger to LANL operations.
- For LANL, DOE has poor knowledge of the fundamental seismic property known as Kappa. The PSHA finds that kappa is a key parameter in assessing the hazard at LANL but that there has been a failure to establish and operate a seismographic network at LANL to acquire the data necessary to determine accurate measurement of kappa. The measurement of kappa will require upgrades to the seismic network and measurements for a period of many years.
- There is poor knowledge of the seimic properties of dacite and dacite is the rock of primary concern for seismic danger beneath many of the LANL facilities that manage hazardous and radionuclide materials including the pld facility where plutonium pits are manufactured and the new plutonium pit facility that is under construction. Measurement of the seismic properties of the dacite requires deep borings at each of these facilities but there are no plans for these borings.
- There is poor knowledge of the distribution of dacite and basalt below the Laboratory facility. The PSHA assumes that only dacite is present below LANL whereas the extensive drilling for the LANL Hydrogeologic Workplan established that basalt is the major rock below LANL . The PSHA failed to use any information from the LANL Hydrogeologic Workplan.

NMED must require DOE to perform the necessary studies to understand the seismic danger for safe management of hazardous materials and hazardous wastes at LANL.

Contaminant Travel Times

When the 1989 permit went into effect, LANL was stating that the travel times for contaminants in the regional aquifer would be tens of thousands of years. In July 2004, CCNS released a report written by George Rice, groundwater hydrologist, entitled *New Mexico's Right to Know: The Potential for Groundwater Contaminants from LANL to Reach the Rio Grande.* Rice conducted a review of DOE, LANL and NMED data and concluded that the travel times are decades – or less. As a result of the Rice report, LANL changed its travel times to decades. The existing permit is based on travel times of tens of thousands of years - not decades.

An entire issue of the *Vadose Zone Journal* was devoted to LANL groundwater issues, including computer modeling. In Keating, Elizabeth, B.A. Robinson, and V.V. Vesselinov, 2005, "Development and Application of Numerical Models to Estimate Fluxes through the Regional Aquifer beneath the Pajarito Plateau," *Vadose Zone Journal*, Volume 4, August, 2005.

"Simulations suggest that flow beneath the Rio Grande (west to east) has been induced by production at the Buckman well Field. Our calculations show that this flux may have increased from zero (pre1980) to approximately 45 kg s^{-1} at present, or about 20% of the total annual production at Buckman" [page 658, Keating et al., 2005].

"Travel times through the regional aquifer are poorly understood because of the lack of tracer tests and *in situ* measurements of effective porosity" [page 658, Keating et al., 2005].

"Data concerning the spatial distribution of anthropogenic [LANL] contaminants in the regional aquifer has been inconclusive because of the exceptionally thick and complex vadose zone which makes it impossible to define the location and timing of contaminant entry to the regional aquifer" [page 658, Keating et al., 2005].

"As shown in Table 3, a significant proportion of **uncertainty** in fluxes downgradient of LANL results from **uncertainty** in the permeability of the basalts. Basalt units are very important for potential contaminant transport because of their expected low effective porosity. **Therefore, we can expect at least a factor of 3 uncertainty in the associated travel times resulting in uncertainty in the flow equation**" [Emphasis Added] [page 666, Keating et al., 2005].

"The current understanding of hydrostratigraphy, as implemented in the numerical models, is sufficient to explain general trends in heads (spatial and temporal) but is lacking in a few key areas such as in the vicinity of R-9, R-12, R-22, and R-16. Detailed transport calculations in the vicinity of these wells would benefit from a refinement of the hydrostratigraphic framework model" [page 667 to 668, Keating et al., 2005]

"The implication of this work for contaminant transport issues is that because of parameter **uncertainty**, predicted fluxes and velocities are quite **uncertain**. **Uncertainties** in permeability and porosity values lead to additional model **uncertainty**" [Emphasis Added] [page 668, Keating et al., 2005].

"These uncertainties can be reduced meaningfully with more data collection, including multi-well pumping and tracer tests" [Keating et al., 2005].

"Finally, local recharge does occur along canyons that cross the LANL property – this recharge has important water quality implication in locations where contaminant effluent discharges have been released" [page 668, Keating et al., 2005].

How has NMED addressed the **uncertainties** in the documents submitted by the Permittees which rely on computer modeling when the LANL scientists acknowledge an uncertainty of three orders of magnitude, or 20 to 20,000 years.

How has NMED addressed the reduced travel times in this permit in order to protect human health and the environment?

Open Burning/Open Detonation Sites

We object to NMED permitting the open burning of high explosives and other hazardous materials as a waste management method at any LANL location, including TA-16-388 and TA-16-399. We specifically object to NMED permitting LANL to open burn these materials at TA-16-388 Flash Pad because on January 10, 2006 DOE/LANL stated that they do not have a need for that facility.

Background. In 2004, DOE/LANL applied for two new construction permits from the NMED Air Quality Bureau (AQB) for open burning activities at three technical areas at LANL, including the Flash Pad at TA-16-388. The NMED AQB issued the permits: Air Quality Permit 2195J for the TA-11 Wood and Fuel Fire Test Site and TA-16 Flash Pad and Air Quality Permit 2195K for the DX-TA-36 Sled Track. CCNS, Tewa Women United and the Embudo Valley Environmental Monitoring Group appealed the permits to the Environmental Improvement Board. On January 10, 2006, DOE/LANL wrote a letter to Richard Goodyear, Program Manager at the NMED AQB, requesting "the Bureau cancel these permits" because as the result of a review of the open burn activities, LANL "no longer needs to perform the types of testing and activities authorized by the permits." A copy of the letter is attached to our comments as **Attachment ***. We request that the letter be added to the Administrative Record.

During the public education campaign about the open burning/open detonation permits, 749 individuals signed postcards to NMED opposing the issuance of the permits. Copies of the receipts signed by NMED are attached to our comments as **Attachment 4.**

Therefore, we request that NMED deny a permit for the open burning activities at TA-16-388. It appears that LANL applied for the permit in 2003, prior to the change in regulations requiring them to apply for a new construction permit for open burning activities.

We also request that NMED deny a permit for open burning activities at TA-16-399.

The draft permit states that "[t]he Permittees shall conduct open burning operations in accordance with this Permit Part, in accordance with 40 CFR Part 264, Subpart X and 40 CFR §§ 268.7(b) and 270, which are incorporated herein by reference, in accordance with Permit Part 12 (TA-16), and Attachment I (Open Burn Unit Management)." The draft permit requires soil monitoring, but does not require groundwater and air monitoring as required in 40 CFR § 264.401 (a) and (c), Subpart X.

If NMED refuses to deny a permit for opening burning activities at TA-16-388 and TA-16-399, then the permit must also include the groundwater and air monitoring requirements found in 40 CFR 264, Subpart X "Miscellaneous Units," specifically § 264.101 (a) and (c) "Environmental performance standards."

If these sites are denied a permit, then they should be covered under the Consent Order, § IV.A.5 "Firing Sites," and should be listed as non-deferred sites for corrective action in Table IV-1.

Thank you in advance for your careful consideration of our comments. Please contact us should you have any questions or comments.

Sincerely,

Joni Arends
Executive Director, CCNS

Robert H. Gilkeson
Registered Geologist

Attachments:
1. NM AGO Lindsay Lovejoy letter to NMED
2. HSS Audit of LANL Emergency Preparedness – to be delivered to NMED
3. January 10, 2006 letter from DOE to NMED AQB

4. Receipts from Congressional offices for the open burning/open detonation postcards opposing such activities at LANL.