New Mexico's Right to Know:

March 20, 2007 Response by Concerned Citizens for Nuclear Safety (CCNS)
to the January 29, 2007 letter from Andrew Phelps,
Associate Director of Environmental Programs
at Los Alamos National Laboratory (LANL)
about reported detections of radionuclides
in the Los Alamos County and the City of Santa Fe drinking water wells

by:
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Third Technical Report
March 2007

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March 20, 2007

Andrew Phelps, Associate Director
Carolyn Mangeng, Acting Associate Director
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Los Alamos, NM 87545

Re: Your Letter of January 29, 2007, EP2007-0004
Information Concerning Radionuclides in Water Supply Wells

Dear Mr. Phelps and Ms. Mangeng:

Thank you for your letter as referenced above, hereinafter referred to as the Phelps letter. We note that Mr. Phelps is being reassigned at Los Alamos National Laboratory (LANL) and therefore we also address this letter to his replacement, Ms. Mangeng.

We believe the Phelps letter is in response to the comments by Concerned Citizens for Nuclear Safety (CCNS) about the draft Site-Wide Environmental Impact Statement for LANL (draft LANL SWEIS), DOE/EIS-0380D. We remain concerned about impacts of LANL contaminants to regional drinking water supplies. The Phelps letter does not addresses the many concerns raised in our comments to the draft LANL SWEIS about the need to protect regional groundwater.

In response to the Phelps letter, we provide the following specific and general comments about LANL's inability to protect the regional drinking water supplies. Robert H. Gilkeson, Registered Geologist, and George Rice, Groundwater Hydrologist, assisted CCNS in preparing these comments. We note the reoccurring pattern of behavior in which LANL presents data to the public for comment and, upon receiving critical comments about the data, LANL later dismisses that data as spurious. This is the case in this situation.

We address our ongoing general concerns about:

1. The radionuclide contamination in the Los Alamos County and City of Santa Fe drinking water wells that are reported in the 1999 and 2006 LANL SWEIS documents.
2. Over three years ago, LANL found elevated levels of chromium in regional characterization well R-28. LANL computer modeling predicts the plume reaches the Los Alamos County and City of Santa Fe drinking water wells. See Figure 4-33, which is attached as Attachment 1. Predicted plume migration for sources released at the water table below Mortandad Canyon, based on a steady-state, with pumping, flow field. Los Alamos National Laboratory's Hydrogeologic Studies of the Pajarito Plateau: A Synthesis of Hydrogeologic Workplan Activities (1998-2004), LA-14263-MS, p. 4-54. Despite the LANL modeling, we still do not know the dimensions of the plume or how fast it is moving toward the drinking water wells.
3. Data Gaps Prevent Accurate Calculation of Contaminant Travel Times by Computer Models. See Attachment 2.
4. DOE/LANL has used improper fluid-assisted drilling methods that mask detection of groundwater contamination for the installation of the LANL characterization wells that are planned to be used as monitoring wells. See Attachment 3.
5. The Need to Plug and Abandon the Old LANL Test Wells, including DT-5A, DT-9 and DT-10 at TA-49, and Install New Characterization Wells. See Attachment 4.
6. The on-going failure of DOE/LANL to formulate a path forward to correct the mistakes made over the past ten years.

CCNS made comments about the radionuclide contamination in the drinking water wells for Los Alamos County and the City of Santa Fe as was reported in Appendix F, "Environmental Sample Data," of the 2006 draft LANL SWEIS. The contamination presented in Appendix F was from a review of LANL water quality data by the consulting company that wrote the draft LANL SWEIS. In addition, the 1999 final LANL SWEIS also reported the measurement of many radionuclide contaminants in the drinking water wells and some of that data is included in the graphs in Appendix F of the 2006 draft LANL SWEIS.

Based on the data presented in the draft LANL SWEIS, CCNS contacted the City of Santa Fe and the County of Los Alamos to discuss the findings. As a result of those meetings, CCNS contacted the Environmental Protection Agency (EPA) about obtaining the necessary funding for additional sampling and analysis of key wells in the public drinking water systems. We then met together, with the New Mexico Environment Department (NMED), to prioritize the wells to be sampled for certain analytes. Sampling took place in late February and early March. We expect the results soon.

In our draft LANL SWEIS comments, CCNS questioned the very high values of neptunium-237 that were reported in the drinking water wells for both Los Alamos County and the City of Santa Fe and expressed the belief that the high values were probably because of the poor resolution of the gamma spectrometry analytical method. CCNS recommended that water samples be analyzed with the high precision alpha spectrometry method. The Phelps letter demonstrates that our recommendation has been followed, and in fact, states that the more precise analytical method did not detect neptunium-237 in any of a limited number of water samples. We question why the LANL did not identify the need years ago to use the proper method to resolve the possible contamination of the drinking water wells with dangerously high levels of neptunium-237.

Unfortunately, the Phelps letter fails to address the detection of radionuclide contamination in the drinking water wells of Los Alamos County and the City of Santa Fe. The two attachments to the Phelps letter indicate the number of detections, the number of samples analyzed and the percentage of detections. It does not provide actual measurements for the detections. We request that the analytical results be provided to us.

Please clarify the source of data in the attachments to the Phelps letter. Is the data limited to the discrete wells that were sampled and the data provided in the LANL Environmental Surveillance Reports for 2001, 2002, 2003 and 2004? See Exhibit 2 to the CCNS draft LANL SWEIS comments.

Specific Comments in Response to the Phelps Letter

Claims made in the Phelps letter are unsupported by the data tables found in the attachments. First, the claim is made:

> For several LANL-derived contaminants, americium-241, cobalt-60, and cesium-137, there were no detections in the water supply wells from 2001-2006. Thus, there are no rising levels of radionuclides in these data.

Americium-241, Cobalt-60 and Cesium-137. In response, there is no information in the Phelps letter to support the claim of no detections of americium-241, cobalt-60, and cesium-137. Whereas, the draft LANL SWEIS reports the common occurrence of all three radionuclides in the drinking water wells. Our conclusion is that the claims in the Phelps letter of "no detections" are technically incorrect and without basis to the data.

Los Alamos County Wells - Table F-18 in Appendix F of the draft LANL SWEIS

Contaminant	No. detected	No. analyzed	Maximum (pCi/L)
americium-241	16	51	0.157*
cobalt-60	1	13	1.76
cesium-137	7	53	15.2

*The measured level of americium-241 exceeds the recommended drinking water standard of 0.15 pCi/L.

City of Santa Fe Wells in the Buckman Well Field
Table F-19 in Appendix F of the draft LANL SWEIS

Contaminant	No. detected	No. analyzed	Maximum (pCi/L)
americium-241	1	15	0.0111
cobalt-60	2	3	1.87
cesium-137	13	25	6.60

The reported presence of the three radionuclide contaminants in the drinking water wells of both Los Alamos County and the City of Santa Fe in the draft LANL SWEIS is a serious problem that cannot be waved away with the unsupported statement that "contamination is not detected."

Plutonium-238, Plutonium-239, -240, Strontium-90 and Tritium. Similarly, the Phelps letter does not adequately address the contamination of the drinking water wells with the radionuclide contaminants plutonium-238, plutonium-239, -240, strontium-90, and tritium.

Los Alamos County Wells - Table F-18 in Appendix F of the draft LANL SWEIS

Contaminant	No. detected[A]		No. analyzed[A]		Maximum (pCi/L)	
plutonium-238	12	(7)	47	(49)	0.0187	N.L.[B]
plutonium-239, -240	12	(2)	47	(49)	0.0308	N.L.
strontium-90	50	(13)	172	(203)	0.272	N.L.
tritium	11	(-)	59	(-)[C]	874	(-)

[A] The first value is from the draft LANL SWEIS. The values in parenthesis are from Attachment 1 of the Phelps letter.
[B] N.L. The measured values are not listed in the Phelps letter.
[C] (-) See discussion of tritium data presented in the Phelps letter below.

City of Santa Fe Wells in the Buckman Well Field
Table F-19 in Appendix F of the draft LANL SWEIS

Contaminant	No. detected[A]		No. analyzed[A]		Maximum (pCi/L)	
plutonium-238	1	(0)	15	(13)	0.00420	N.L.[B]
plutonium-239,-240	2	(0)	15	(13)	0.00910	N.L.
strontium-90	10	(0)	32	(34)	0.226	N.L.
tritium	4	(-)	14	(-)[C]	84.1	(-)

[A] The first value is from the draft LANL SWEIS. The values in parenthesis are from Attachment 2 of the Phelps letter.
[B] N.L. The measured values are not listed in the Phelps letter.
[C] (-) See discussion of tritium data presented in the Phelps letter below.

The Phelps letter acknowledges many fewer "detections" of contamination for every radionuclide compared to the number of detections in the draft LANL SWEIS without any defense of the discrepancy. Simply listing fewer detections does not prove there are fewer detections. In addition, the Phelps letter does not adequately defend the dismissal of the "detections" mentioned with the rationale of "below 3 sigma" or "false positives."

The draft LANL SWEIS presents many detections of tritium contamination in the drinking water wells of both Los Alamos County (to a maximum level of 874 pCi/L) and the Buckman Well Field (to a maximum level of 84.1 pCi/L). However, the Phelps letter claims that tritium is only detected in Los Alamos County water supply well Otowi-1.

Further, the conclusion in the Phelps letter that the tritium measured in well Otowi-1 is the only radionuclide contamination measured in any of the drinking water wells of Los Alamos County or the City of Santa Fe is not supported by any factual data. The potential for LANL contaminants to travel to the drinking water wells is unknown. The new network of LANL characterization wells do not produce reliable and representative water samples for the presence or absence of the LANL radionuclide contaminants.

General Comments

There are many recent LANL reports and independent reports by the Department of Energy Inspector General (DOE IG) and the EPA that prove the new network of LANL characterization wells and the old LANL test wells do not produce reliable data for the contamination of the regional aquifer with radionuclides and chemicals from LANL wastes.

Environmental Protection Agency (EPA). DOE/LANL allowed organic drilling additives (both organic fluids, foams and clay muds) to invade the screened intervals in all of the new characterization wells installed during the past ten years under the Hydrogeologic Workplan. In addition, many of the new wells were drilled with the mud-rotary method that invaded the screened intervals with bentonite clay drilling muds that also contained organic additives. The organic and bentonite clay drilling additives have well-known properties to mask the detection of most LANL chemical and radionuclide contaminants. The organic additives create a new mineralogy of iron precipitates, a slime that coats the strata and surrounds the screened interval, masking the detection of contamination. The failure of DOE/LANL to install a reliable network of monitoring wells is summarized in the notes recorded by a LANL scientist of a telephone conference call with the scientists from the EPA National Risk Management Research Laboratory in Ada, Oklahoma:

> EPA also thought that iron minerals would not return to predrilling conditions in the foreseeable future.
>
> EPA further expressed the opinion that it would be difficult to determine when and whether the impacted screens would return to predrilling conditions. EPA expressed the opinion that LANL would never be able to get representative samples from the impacted wells, but could only make choices and tradeoffs based on specific contaminants at various locations.

Department of Energy (DOE) Inspector General. The DOE IG wrote a report that described the failure of DOE/LANL to meet the requirements of the Resource Conservation and Recovery Act (RCRA) to install monitoring wells that produce reliable and representative water samples for the detection of LANL contaminants. From IG Report DOE/IG-0703, September 2005:

> However, LANL did not adhere to specific constraints established in the RCRA guidance when using muds and other drilling fluids, and, as a result, LANL could not assure that certain residual drilling fluids were fully removed; and muds and other drilling fluids that remained in certain wells after construction created a chemical environment that could mask the presence of radionuclide contamination and compromise the reliability of groundwater contamination data.

The DOE IG Report also described the requirement for DOE/LANL to implement a surveillance groundwater monitoring program by December 31, 2005 under DOE Order 450.1. DOE/LANL are not in compliance with the DOE Order. Again, from the DOE IG Report:

> The current requirements for a groundwater surveillance monitoring program are found in DOE O 450.1, "Environmental Protection Program," which LANL has until December 31, 2005, to implement. As LANL works to meet this deadline, we

believe that the Laboratory should, as the Hydrogeologic Workplan wells are converted to monitoring wells, ensure that monitoring data are reliable. We also believe that particular attention should be given to well development and purging methods, the quality of radionuclide data, and any qualifications on that data.

LANL Well Screen Analysis Report (WSAR). DOE/LANL are not in compliance with the DOE Order as demonstrated by the conclusion presented in the LANL Well Screen Analysis Report (WSAR), which was published in November 2005. The WSAR states that only approximately 50% of the new LANL characterization wells produce reliable and representative water samples. The WSAR was only a study of the effects of the drilling additives on the water quality data and did not address the many other factors that prevent the wells from meeting the requirements of monitoring wells.

On September 18, 2006, the New Mexico Environment Department (NMED) issued a Notice of Disapproval to LANL for the WSAR because of its failure to perform a thorough study. When all factors are considered, the number of LANL characterization wells that fail to produce representative and reliable water quality data is possibly greater than 90%. In the past few days, LANL submitted the first revision of the WSAR to NMED as required by the Notice of Disapproval. CCNS will provide comments about the revised WSAR to NMED.

CCNS Recommendations

A Rigorous Sampling Program is Needed. A rigorous monthly sampling program for the Los Alamos County and Santa Fe drinking water wells and the construction of new characterization wells are necessary because of the:

1. failure of DOE/LANL to install the surveillance network of monitoring wells as required by RCRA and DOE Order 450.1, and
2. contamination that is reported in the 2006 draft LANL SWEIS and in the 1999 final LANL SWEIS.

The unreliable new network of characterization wells does not provide accurate information about the characteristics of the groundwater beneath LANL which is required by DOE Order 450.1, RCRA, New Mexico Water Quality Control Commission regulations, as well as the NMED/LANL Consent Order. After 10 years and approximately $150 million, the continued obfuscation of data does not help the process, nor protect drinking water supplies. Data from a reliable network of monitoring wells is the frontline of information about the source of contamination and impacts to the drinking water wells.

The rigorous sampling program requires collection of water samples on a monthly schedule. The analysis of those samples must be for a large suite of naturally occurring chemical and radionuclide constituents, chemical contaminants and radionuclide

contaminants, done with the appropriate analytical methods for the highest possible precision in the measurements.

The question remains whether the contamination is present in the drinking water wells, while people are drinking the water. An independent verification and validation process is needed. DOE must hire an independent contractor to resolve this matter.

The Need for an Independent Company to Review LANL Data. The contradiction between the claim of "no contamination" in the Phelps letter and the large amount of contamination listed in the data tables in the two LANL SWEIS documents (1999 final and 2006 draft) are critical issues that LANL cannot resolve. There is a need for an independent company to conduct a careful review of the radionuclide and chemical contaminant data for the drinking water wells of Los Alamos County and the City of Santa Fe, with specific data quality objectives.

It is a poor process and the data in the LANL Water Quality Database are in poor repair. The data are published in critically important reports about which DOE/LANL has requested public comments under the National Environmental Policy Act (NEPA). CCNS and other interested organizations and people have spent considerable time and effort to make comments about the environmental consequences of past, current and proposed new activities at LANL. Once again, we are dismayed to learn that LANL now says that the data published in LANL reports written to satisfy requirements under NEPA are spurious. Therefore, the draft LANL SWEIS should be retracted and a new draft submitted to the public for review.

The databases that are used to provide spurious data for the SWEIS documents, reports to Congress and NMED, annual LANL Environmental Surveillance Reports, and Agency for Toxic Substances and Disease Registry (ATSDR) reports, among others, must be thoroughly reviewed. The Phelps letter is one example of a larger problem. In order to protect public health and the environment, LANL has a responsibility to provide accurate data in these reports. We ask why this problem exists. We request again for the retraction of the reports listed in this paragraph.

Attachments. The following are provided in further support of the issues raised in this letter and our comments to the draft LANL SWEIS and are available on our website at www.nuclearactive.org:

1. Attachment 1. Figure 4-33. Predicted plume migration for sources released at the water table below Mortandad Canyon, based on a steady-state, with pumping, flow field. Los Alamos National Laboratory's Hydrogeologic Studies of the Pajarito Plateau: A Synthesis of Hydrogeologic Workplan Activities (1998-2004), LA-14263-MS, p. 4-54.
2. Attachment 2. Data Gaps Prevent Accurate Calculation of Contaminant Travel Times by Computer Models.

3. Attachment 3. DOE/LANL has used improper fluid-assisted drilling methods that mask detection of groundwater contamination for the installation of the LANL characterization wells that are planned to be used as monitoring wells.
4. Attachment 4. The Need to Plug and Abandon the Old LANL Test Wells, including DT-5A, DT-9 and DT-10 at TA-49, and Install New Characterization Wells.

We also reference the Exhibits to the CCNS and EVEMG Comments about draft LANL SWEIS, dated September 20, 2006, which may be found at www.nuclearactive.org:

5. Exhibit 1. The Complex Geologic Setting Beneath LANL Requires the Use of Drilling Methods that Mask Detection of Most Radionuclide and Chemical Contaminants in Groundwater, by Robert H. Gilkeson.
6. Exhibit 2. Deficiencies in the Draft LANL SWEIS for the Water Quality Data Produced From the LANL Monitoring Wells, by Robert H. Gilkeson.
7. Exhibit 3. Failure of Draft LANL SWEIS to Address the Environmental Impact From the Hexavalent Chromium Plume in the Regional Aquifer, by Robert H. Gilkeson.
8. Exhibit 4. Failure of the Draft LANL SWEIS to Address Environmental Impact Because of Groundwater Contamination From the RCRA Regulated Disposal Sites at Technical Area 54, by Robert H. Gilkeson.
9. Exhibit 5. Comments on the Draft Site-Wide Environmental Impact Statement for Continued Operations of Los Alamos National Laboratory, Los Alamos New Mexico, by George Rice.

Figures for Exhibits 1 to 4, listed above, are also available at www.nuclearactive.org.
10. Figure 1-1. Map showing location of wells constructed under the Hydrogeologic Workplan.
11. Figure 1-2. Overall condition of screens for producing reliable and representative water-quality samples as of November 2005.
12. Figure 1-3. Hydrostatigraphy at LANL Wells R-28 and R-13.
13. Figure 1-4. Schlumberger Permeability Logs for Wells R-28 and R-34.
14. Figure 1-5. The misrepresentation in the LANL "Synthesis Report" that the regional aquifer beneath the San Ildefonso Pueblo does not have high permeability.
15. Figure 1-6. The LANL characterization wells R-16, R-20, R-21, R-22, R-23, and R-32 that surround the three RCRA regulated units MDA G (Area G), MDA L, and MDA H. None of the six wells meet the requirements of RCRA for monitoring groundwater contamination.
16. Figure 1-7. As-built construction of LANL characterization well R-16, a sentry well for LANL contaminants traveling to the Rio Grande and to the Buckman well field.
17. Figure 1-8. Well R-16 Schlumberger Geophysics of Screen #4.
18. Figure 1-9. Schlumberger Geophysics for Well R-22.

Next Steps. We understand from Ines Triay and George Rael that a meeting will be set up to discuss these issues. We look forward to your response and continuing this dialogue in order to protect critical regional drinking water supplies. Should you have any questions or comments, please contact us by phone or email.

Sincerely,

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Attachment: January 29, 2007 Phelps letter in .pdf
Attachment 1. Figure 4-33. Predicted plume migration for sources released at the water table below Mortandad Canyon, based on a steady-state, with pumping, flow field.

cc: Senator Jeff Bingman
Senator Pete V. Domenici
Representative Tom Udall
Governor Bill Richardson
Senate and House Members of the New Mexico State Legislature
Senate and Assembly Members of the California State Legislature
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