



*Environmental Programs*

**LANL Water Stewardship Program**

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Date: January 29, 2007

Refer to: EP2007-0004

Ms. Joni Arends  
Executive Director  
Concerned Citizens for Nuclear Safety  
107 Cienega  
Santa Fe, NM 87501

**SUBJECT: INFORMATION CONCERNING RADIONUCLIDES IN WATER SUPPLY WELLS**

Dear Ms. Arends:

Thank you for your request and your concern regarding potential neptunium-237, plutonium-238, 239 and 240, americium-241, cesium-137 and strontium-90 contamination in the drinking water supply wells for Los Alamos County and the Buckman Wellfield. The protection of the drinking water supplies of nearby communities is one of the primary groundwater protection goals of the Laboratory. We appreciate the opportunity to provide information on this subject.

The Laboratory added alpha spectrometry analysis for neptunium for the Los Alamos County water supply wells samples in December 2006. We also identified some existing August 2006 Los Alamos County water supply samples at the analytical chemistry laboratory. We asked the analytical laboratory to also analyze these samples for neptunium using alpha spectrometry. The results for the August 2006 samples were all non-detects.

We reviewed the radioactivity data for Los Alamos County supply wells from 2001-2006 (attached). This period of record was chosen because the same independent analytical laboratory analyzed the water supply samples during this period. We have also included a period of 2001-2004 to correspond to the data record presented in the Site-Wide Environmental Impact Statement (SWEIS).

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From the attachment, it can be seen that there are routine detections of naturally occurring radionuclides, such as uranium, potassium-40, and gross beta. For the remaining radionuclides the overall pattern is that they are not detected in water supply samples. 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.

Tritium has been detected at Los Alamos County water supply well Otowi-1 (O-1). These values are less than 0.3% of the drinking water standard, although this well is not used for supplying drinking water. These data are routinely reported in the Environmental Surveillance Report. Beginning in 2000, the tritium measurements at O-1 increased for four years from about 30 pCi/L to 60 pCi/L, and have decreased to about 20 pCi/L over the past two years.

Detections of LANL-derived contaminants, such as plutonium, americium, and strontium, have occurred sporadically in water supply wells. As indicated in the attachment, the bulk of these detections occurred from samples collected at the same time and analyzed by the analytical laboratory in the same batch. Because the overall frequency of detection is low, we believe that these sporadic detections are false positives or caused by problems at the analytical laboratory. This conclusion is supported by numerous reanalyses of these samples and by lack of consistent detections in paired samples. Again, there are no increasing trends in these data.

In conclusion, we believe the data demonstrate no radionuclide detections in the water supply wells, with the exception of tritium in Otowi-1.

We welcome your continued comments and concerns about the drinking water systems. If you have further questions, please contact Lorrie Bonds Lopez, (505) 665-0216, or [lorriel@lanl.gov](mailto:lorriel@lanl.gov).

Sincerely,



Andrew Phelps  
Associate Director  
Environmental Programs

AP/JD/tml

Enclosure: 1) Water Supply Radioactivity Summary from WQDB  
2) Santa Fe City Water Supply Radioactivity Summary from WQDB

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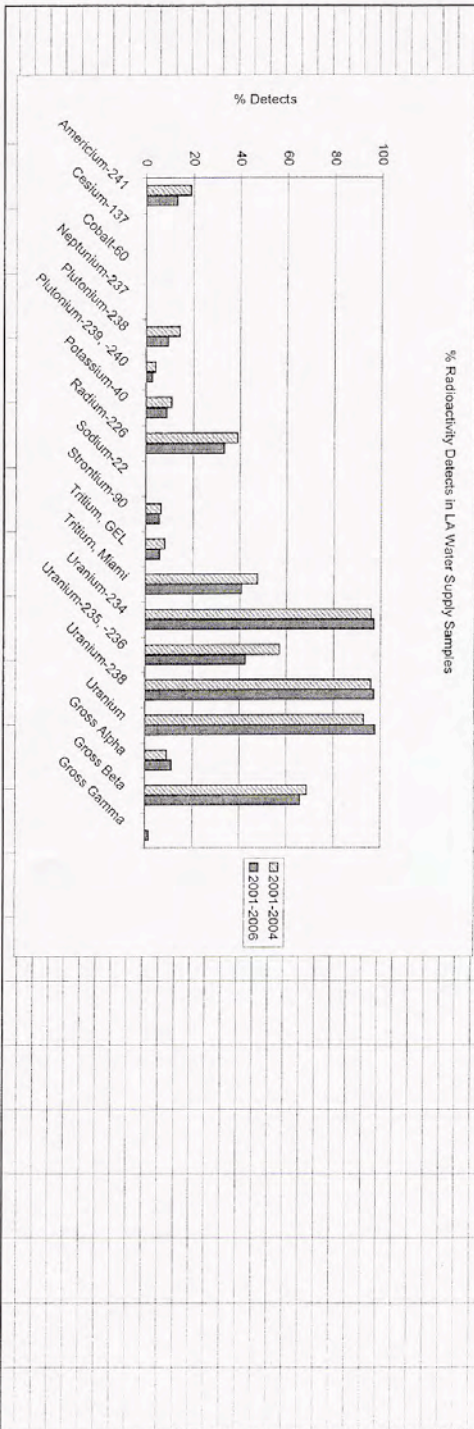
Cy: (continued)  
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LWSP File, MS M992  
IRM-RMMSO, MS A150  
RPF, MS M707

Water Supply Radioactivity Summary from WQDB-

Measurement	WQDB - 2001-2004			WQDB - 2001-2006			notes
	detected	analyzed	% detect	detected	analyzed	% detect	
Americium-241	0	52	18.8	10	77	13.0	6 detects on S1901, one not supported by dup, also detected in 2 field blanks, 4 detects on B23003, latter not confirmed by reanalysis
Cesium-137	0	52	0.0	0	79	0.0	
Cobalt-60	0	52	0.0	0	88	0.0	
Neptunium-237	0	52	0.0	0	88	0.0	
Plutonium-238	0	48	14.2	7	78	9.0	7 detects on S1901, one not supported by dup, one in field blank, result=mda, unconf=0
Plutonium-238 -240	2	48	4.1	2	78	2.6	2 detects on S1901, one not supported by dup, result=mda, unconf=0
Potassium-40	6	55	10.9	7	78	8.9	2 detects on S1901, 3 detects on B23003, one not supported by field dup, 1 detect on S2004, not supported by field dup, one detect on S11706
Radium-226	14	36	38.9	16	78	33.8	naturally occurring
Sodium-22	0	55	0.0	0	78	0.0	
Strontium-90	13	203	6.4	13	222	5.9	13 detects on 11/28/01 by EPA-905, 5 qualified U in secondary validation, one U on reanalysis
Tritium, GEL	5	61	8.2	5	66	7.6	5 detects on S1904
Tritium, Miami	47	139	47.5	72	177	40.7	57 detects in O-1
Uranium-234	66	49	133.0	71	73	97.3	naturally occurring, 2 ND and one detect (B21003) in field blanks
Uranium-235, -236	26	49	53.1	31	73	42.6	naturally occurring, one detect in field blank (B21003)
Uranium-238	47	48	97.9	71	73	97.3	naturally occurring, 2 ND and one detect (B21003) in field blanks
Uranium	13	14	92.9	42	43	97.7	naturally occurring, one ND in field blank
Gross Alpha	6	64	9.4	10	89	11.2	naturally occurring, 2 detects on B2402, three on S2004, three on S18005
Gross Beta	44	64	68.8	58	88	65.9	naturally occurring
Gross Gamma	0	36	0.0	1	59	1.7	naturally occurring

Notes:  
 WQDB detection based on analytical laboratory qualifiers (no X or U qualifiers)  
 except Miami Tritium detection based on result < 3 \* uncertainty.  
 Except for Miami Tritium, all analyses by GEL.

% Radioactivity Detects in LA Water Supply Samples



Santa Fe City Water Supply Radioactivity Summary from WQDB -

Measurement	WQDB - 2001-2004		WQDB - 2001-2006		notes
	detected	% detect	detected	% detect	
Americium-241	0	0.0	0	0.0	
Cesium-137	0	0.0	18	18.0	
Cobalt-60	0	0.0	0	0.0	
Neptunium-237	0	0.0	18	18.0	
Plutonium-238	0	0.0	1	1.0	one detect 7/12/2006, just above MDA, below 3 sigma
Plutonium-239, -240	0	0.0	19	19.0	
Potassium-40	2	16.7	4	18.0	22.2 naturally occurring
Radium-226	6	42.9	9	17.0	52.9 naturally occurring
Sodium-22	0	0.0	0	0.0	
Strontium-90	0	0.0	43	43.0	
Tritium, GEL	0	0.0	15	15.0	
Tritium, Miami	5	11.4	5	48.0	10.4
Uranium-234	29	64.4	35	51.0	68.6 naturally occurring, 16 R values 10/13/01
Uranium-235, -236	27	60.0	33	51.0	64.7 naturally occurring, 16 R values 10/13/01
Uranium-238	29	64.4	35	51.0	68.6 naturally occurring, 16 R values 10/13/01
Uranium	34	100.0	45	45.0	100.0 naturally occurring
Gross Alpha	13	13.0	19	19.0	100.0 naturally occurring
Gross Beta	11	84.6	17	17.0	89.5 naturally occurring
Gross Gamma	0	0.0	18	18.0	0.0 naturally occurring

Notes:  
 WQDB detection based on analytical laboratory qualifiers (no X or U qualifiers) and secondary validation qualifiers (no R qualifiers)  
 except Miami tritium detection based on result < 3 \* uncertainty.  
 Except for Miami, tritium and four uranium results by EES-6; all analyses by GEL.

