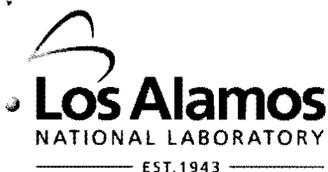


General

 ENTERED



*Environmental Programs*  
P.O. Box 1663, MS M991  
Los Alamos, New Mexico 87545  
(505) 606-2337/Fax (505) 665-1812

Date: **DEC 15 2009**  
Refer To: EP2009-0685

James Bearzi, Bureau Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6303

**Subject: Radionuclide Screening Action Level Updates**



Dear Mr. Bearzi:

Enclosed, please find two copies of the table presenting updates to the radionuclide screening action levels (SALs). The SALs were checked to determine whether the recent version of the U.S. Department of Energy residual radioactive computer code (RESRAD) resulted in changes to the SALs.

The enclosed table shows that several values have changed slightly based on RESRAD, Version 6.5. Starting in January 2010, the SALs provided in the table will be used in reports submitted to the New Mexico Environment Department Hazardous Waste Bureau.

If you have any questions, please contact Richard Mirenda at (505) 665-6953 (rmirenda@lanl.gov).

Sincerely,

A handwritten signature in cursive script, appearing to read 'M. J. Graham'.

Michael J. Graham, Associate Director  
Environmental Programs  
Los Alamos National Laboratory



MG/DG/DN/PN/RM:sm

Attachment: Radionuclide Screening Action Levels from RESRAD, Version 6.5 (LA-UR-09-8111)

Cy: (w/att.)  
RPF, MS M707

Cy: (w/o att.)  
Tom Skibitski, NMED-OB, Santa Fe, NM  
Steve Yanicak, NMED-DOE-OB, MS M894  
David Gregory, DOE-LASO, MS A316  
Annette Russell, DOE-LASO (date-stamped letter emailed)  
Rich Mirenda, EP-EDA, MS M992  
Ellen Louderbough, LC-LESH, MS A187  
Craig Eberhart, EP-EDA, MS M992  
Alison Dorries, EP-WES, MS M996  
Michael J. Graham, ADEP, MS M991  
IRM-RMMSO, MS A150 (date-stamped letter emailed)

### Radionuclide Screening Action Levels (SALs) from RESRAD, Version 6.5

Radionuclide	Residential SAL (pCi/g)	Industrial SAL (pCi/g)	Construction Worker SAL (pCi/g)	Recreational SAL (pCi/g)	Time at which SAL Applies <sup>a</sup> (yr)
Americium-241	30	180	34	280	0.0
Cobalt-60	1.3	5.1	4.1	46	0.0
Cesium-134	2.4	9.7	7.7	87	0.0
Cesium-137+D <sup>b</sup>	5.6	23	18	210	0.0
Europium-152	2.9	11	9.1	100	0.0
Europium-154	2.7	11	8.4	95	0.0
Europium-155	110	450	360	4000	0.0
Tritium	750	4.4 x 10 <sup>5</sup>	3.2 x 10 <sup>5</sup>	<b>5.3 x 10<sup>6</sup></b> (5.1 x 10 <sup>6</sup> )	0.0
Iodine-129	44	1800	<b>570 (580)</b>	3500	0.0
Manganese-54	5.5	22	18	200	0.0
Sodium-22	1.6	6.5	5.2	58	0.0
Nickel-63	8900	1.3 x 10 <sup>6</sup>	3.0 x 10 <sup>5</sup>	1.8 x 10 <sup>6</sup>	0.0
Neptunium-237+D	2.4	50	19	170	0.0 <sup>c</sup>
Plutonium-238	37	240	40	330	0.0
Plutonium-239 <sup>d</sup>	33	210	36	300	0.0
Radium-226+D <sup>e</sup>	5	5	5 <sup>f</sup>	5 <sup>g</sup>	n/a <sup>h</sup>
Radium-228+D <sup>e</sup>	5	5	5 <sup>f</sup>	5 <sup>g</sup>	n/a
Ruthenium-106+D	20	83	66	740	0.0
Strontium-90+D	5.7	1900	800	5600	0.0
Technetium-99	36	2.8 x 10 <sup>5</sup>	98000	6.4 x 10 <sup>5</sup>	0.0
Thorium-228+D	2.3	9.0	6.8	<b>78 (77)</b>	0.0
Thorium-230 <sup>e</sup>	5	5	- <sup>f</sup>	5 <sup>g</sup>	n/a
Thorium-232 <sup>e</sup>	5	5	- <sup>f</sup>	5 <sup>g</sup>	n/a
Uranium-234	170	1500	220	3200	1000
Uranium-235+D	17	87	43	520	1000
Uranium-238+D	<b>87 (86)</b>	430	160	2100	1000

Note: Values in parentheses in the table and footnote g below are the older SALs, the bolded values are the revised SALs.

<sup>a</sup> Modeling period is 1000 yr. Soil criteria at other times within the modeling period are higher.

<sup>b</sup> Includes contribution to dose of radionuclide progeny.

<sup>c</sup> Actual difference in SALs between years 0 and 1000 is negligible.

<sup>d</sup> Plutonium-239 and plutonium-240 are typically unresolved in laboratory analysis. SALs for the two isotopes are identical.

<sup>e</sup> The SAL is the generic soil guideline for release of property published in Chapter 4 (Residual Radioactive Material) of DOE Order 5400.5. Five (5) pCi/g applies to the concentration averaged over the first 15 cm of soil below the surface, for subsequent 15-cm-thick layers the generic soil guideline is 15 pCi/g. If both thorium-230 and radium-226, or both thorium-232 and radium-228, are present and not in secular equilibrium, or if other mixtures of radon-generating radionuclides occur, refer to DOE Order 5400.5 for guidance in establishing soil criteria.

<sup>f</sup> The SAL for the scenario that will apply following construction, based on the conceptual site model, should be used.

<sup>g</sup> The value of 5 pCi/g is protective of all possible recreational activities, including situations where enclosed structures may exist on the site to capture radon gas. In topographically constrained areas where structures are infeasible, such as hillsides or drainages, dose-based SALs may be employed as follows:

- Radium-226: 55 pCi/g, at 73 yr.
- Radium-228: 70 pCi/g, at 2.7 yr.
- Thorium-230: **110 pCi/g** (150 pCi/g), at 1000 yr.
- Thorium-232: 40 pCi/g, at 140 yr.

<sup>h</sup> n/a = Not applicable.