

General



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Mr. David Cobrain  
NMED - Hazardous Waste Bureau  
2905 Rodeo Park Dr. East  
Building One  
Santa Fe, NM 87505

NMED  
Hazardous Waste Bureau

RE: Draft Technical Review Comments on the Derivation and Use of Radionuclide Screening Action Levels, Revision 3, Los Alamos National Laboratory, Los Alamos, New Mexico, Dated December 2014

Dear Mr. Cobrain:

Attached please find draft technical review comments on the subject Derivation and Use of Radionuclide Screening Action Levels, Revision 3, Los Alamos National Laboratory, Los Alamos, New Mexico, dated December 2014 (Revision 3). This report presents the results as well as information on the derivation and the use of the third revision of the radionuclide Screening Action Levels (SALs) determined by the Los Alamos National Laboratory (LANL).

The third revision of the LANL SALs follows the methodology used in the 2012-2013 revision (Revision 2), provided as Appendix C of the Revision 3 document. The results presented in Revision 3 appear to be calculated as described in the text. The calculation of the plant ingestion rates used in the residential exposure scenario included the basis of the calculated values but additional clarification and details in the text is recommended for users of the SALs.

Section 6.1.1, Residential Scenario Variable Exposure Parameters, indicates the plant ingestion rates used in determining the SALs for the residential exposure scenario are determined as the "age-weighted body-weight normalized sum of mean per capita fruit and vegetable ingestion rates..." Examination of the methodology used by EPA to calculate fruit and vegetable ingestion rates in the 2014 revision of the Radiological Preliminary Remediation Goals indicates that EPA and LANL used similar approaches in calculating ingestion rates, although some details differ:

- EPA employed age-specific data not adjusted for preparation and cooking losses from Table 13-1 of EPA's 2011 Exposure Factors Handbook while LANL used data adjusted for preparation and cooking losses from the same table. Thus, the child and adult plant ingestion rates calculated using EPA's approach are expected to exceed the rates calculated by LANL.

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- EPA used an age range of 0 to 6 years for the child and 6 to 40 for the adult to calculate ingestion rates. The age ranges used by LANL are 0 to less than 21 years for a child receptor and 21 to 65 years for an adult receptor. It is not clear why LANL chose these age ranges. While LANL's plant ingestion rate of 22.1 kilograms per year (kg/yr) for adults was verified, the child plant ingestion rate of 14 kg/yr could not be reproduced unless an age range of 0 to less than 16 years was used.

To ensure that users of the LANL SALs understand the basis of the plant ingestion rates reported in Section 6.1.1 of Revision 3, the enclosed technical review comments recommend that additional details related to the calculation of the rates and additional support for the age ranges used be added to the text.

Also, NMED has posted a revision of the *Risk Assessment Guidance for Site Investigations and Remediation* (SSG) to its guidance web site. In cases where Revision 3 references the 2012 version of the SSG and the referenced information remains available in the 2014 version, the references should be updated to reflect the 2014 version of the document.

If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at [paigewalton@msn.com](mailto:paigewalton@msn.com).

Thank you,



Paige Walton  
AQS Senior Scientist and Program Manager

Enclosure

cc: Neelam Dhawan, NMED (electronic)  
Michael Smith, AQS (electronic)  
Joel Workman, AQS (electronic)

**Draft Technical Review Comments on the  
Derivation and Use of Radionuclide Screening Action Levels, Revision 3  
Los Alamos National Laboratory  
Los Alamos, New Mexico,  
Dated September 2014**

**TECHNICAL REVIEW COMMENTS**

1. Section 6.1.1, Residential Scenario Variable Exposure Parameters, page 6, indicates the plant ingestion rate used in determining the radionuclide screening action levels (SALs) for the residential exposure scenario are determined as the “age-weighted body-weight normalized sum of mean per capita fruit and vegetable ingestion rates...” EPA’s *Exposure Factors Handbook: 2011 Edition*, specifically Tables 13-1 and 8-1, is referenced as the source of the data used in the ingestion rate calculation. While Revision 3 does not present the specific methodology used in calculating the child and adult plant ingestion rates [reported as 14 and 22.1 kilograms per year (kg/yr), respectively], examination of the methodology used by EPA to calculate fruit and vegetable ingestion rates in the 2014 revision of the Preliminary Remediation Goals for Radionuclides (<http://epa-prgs.ornl.gov/radionuclides/whatsnew.html>) indicates that similar approaches were applied in both cases, although some details differed (e.g., choice of data, age range for child and adult receptors). EPA employed “Consumers Only, Unadjusted”<sup>1</sup> age-specific data from Table 13-1 of the Exposure Factors Handbook while LANL used “Per Capita for Populations That Garden or Farm, Adjusted”<sup>2</sup> data from the same table. Thus, the child and adult plant ingestion rates calculated by EPA are expected to exceed the rates calculated by LANL (e.g., the produce ingestion rate for adults 21 to 65 years old based on the data used by EPA is 53 kg/yr compared to the rate of 22.1 kg/yr calculated by LANL for ingestion of fruit and vegetables). To ensure that users of the LANL SALs understand that SALs reflecting ingestion of fruits and vegetables are based on ingestion rates lower than those obtained using EPA’s approach, it is recommended that Section 6.1.1 of the text be revised to include additional details regarding the derivation of the child and adult plant ingestion rates reported in the text.
2. Section 6.1.1, page 6, states that the age ranges for calculating child and adult plant ingestion rates are 0 to less than 21 years for a child receptor and 21 to 65 years for an adult receptor. However, it is not clear why these age ranges were chosen. In addition, the reported plant ingestion rate for child receptors could not be verified unless the age range was limited to 0 to less than 16 years; thus, this calculation should be reviewed to ensure that the rate was calculated as described in the text. In addition, it is recommended that information supporting the use of the age ranges stated in Section 6.1.1 be added to the text to ensure that users of the LANL SALs understand the basis of the reported plant ingestion rates. The information supporting the stated age ranges should be similar to that provided in Section 6.1.4, Recreational Scenario Variable Exposure Parameters, in support of the age range (6 to less than 12 years) for child recreational receptors.

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<sup>1</sup> Not adjusted to account for preparation or post-cooking losses.

<sup>2</sup> Adjusted for preparation and post-cooking losses.

3. NMED has recently posted a revised version of the *Risk Assessment Guidance for Site Investigations and Remediation*, dated December 2014 (SSG), to its guidance web page:

<http://www.nmenv.state.nm.us/HWB/guidance.htm>

Where the information referenced in the 2012 version of the SSG remains available in the 2014 version, it is recommended that the references be revised to reflect the 2014 version of the document.