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STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

Bob Holden, Governor • Stephen M. Mahfood, Director

www.dnr.state.mo.us

December 30, 2003

Ms. Sharon Cotner, Project Manager  
United States Army Corps of Engineers  
8945 Latty Avenue  
Berkeley, Missouri 63134

Re: Addendum to Comments on the Review of the draft document titled "Derivation of Site-Specific DCGLs for North County Structures" Rev. B2, October 29, 2003.

Dear Ms. Cotner:

This letter includes an addendum to comments on the review of the draft document titled "Derivation of Site-Specific DCGLs for North County Structures". These were provided to us by the Missouri Department of Health and Senior Services.

As stated in our last letter, it is extremely important that questions we have on this particular document be resolved because they relate to whether or not the guidelines are compliant with CERCLA. A risk-based analysis is needed to demonstrate compliance. In addition, more detail is required regarding the derivation of gross alpha and beta values.

We are also requesting that you consider hosting a technical working group meeting on this matter to include the U.S. Environmental Protection Agency, the Missouri Department of Health and Senior Services, and this office. This request is made with the goal of having technical staff from the various government agencies concur on (or develop) guidelines for presentation within the upcoming draft North County Record of Decision.

Thank you for the deadline extension on accepting comments. If you or your staff have any question, I can be reached by phone at (314) 877-3250 or (314) 265-3644.

Sincerely,

HAZARDOUS WASTE PROGRAM

*Eric Gilstrap*

Eric Gilstrap, PE  
Environmental Engineer

EG:dd

Attachment: MoDHSS Comment Letter and Calculation Sheet on the Review of Derivation of Site Specific DCGLs for North County Structures.

c: Mr. Scott A. Clardy, Missouri Department of Health and Senior Services  
Mr. Dan Wall, United States Environmental Protection Agency-Region VII



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*Dist: Blum, Matthey, Chambers, Hand*



**Missouri Department of Health and Senior Services**

P.O. Box 570, Jefferson City, MO 65102-0570 Phone: 573-751-6400 FAX: 573-751-6010

Richard C. Dunn  
Director



Bob Holden  
Governor

December 23, 2003

Mr. Eric Gilstrap  
Missouri Department of Natural Resources  
Air and Land Protection Division  
Hazardous Waste Program  
Federal Facility Section  
PO Box 176  
Jefferson City, MO 65102-0176

RE: Comments regarding the draft document *DERIVATION OF SITE-SPECIFIC DCGLS FOR NORTH COUNTY STRUCTURES*

Dear Mr. Gilstrap:

Thank you for allowing the Missouri Department of Health and Senior Services (DHSS) the opportunity to comment on this draft document developed by Science Applications International Corporation (SAIC). A copy of the document was received by DHSS on November 26, 2003. The Missouri Department of Natural Resources requested that DHSS provide comments by December 29, 2003.

To adequately assess the risk to human health, DHSS recommends a risk-based approach to calculate preliminary remediation goals for each radionuclide. Clean up, if necessary, should achieve a cumulative risk within the  $1.0 \times 10^{-4}$  to  $1.0 \times 10^{-6}$  carcinogenic risk range based on a reasonable maximum exposure. The contamination for the building(s) in question poses exposure scenarios, which may be assessed using RESRAD-BUILD. When using RESRAD-BUILD it is important to consider that using a benchmark dose of 15 milliRem/year correlates to a total excess carcinogenic risk of  $3.0 \times 10^{-4}$ . Environmental Protection Agency has concluded that this should be the maximum dose limit for humans. With this in mind, please consider the following comments regarding the document.

**Section 3.3.1**

1. In the RESRAD-BUILD (version 3.1) calculations, SAIC used a value of 0.07 for the Air Release Fraction parameter and a value of 0.2 for the Removable Fraction parameter. Table 3-1 in Section 3.3 of the *User's Manual for RESRAD-BUILD Version 3* lists template data values for key parameters used in the building occupancy and building renovation scenarios. In a December 8, 2003 electronic mail to DHSS, a representative of the Argonne National Laboratory recommended the use of these template data values. Therefore, DHSS recommends that values of 0.357 for the Air Release Fraction and 0.1 for the Removable Fraction be used in a building occupancy scenario or provide further justification as to why these values were not used.

[www.dhss.state.mo.us](http://www.dhss.state.mo.us)

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DHSS ran the Industrial Worker Building Occupancy Scenario dose calculation with RESRAD-BUILD (version 3.21, the most recent version) using the recommended template data values for the Air Release Fraction (0.357) and Removable Fraction (0.1) parameters. Derived concentration guideline levels (DCGLs) were calculated and are included as an attachment. The DHSS calculated DCGLs were considerably less than the SAIC calculated DCGLs.

### Section 3.3.2

2. The Renovation Worker scenario uses building occupancy inputs given an area source. Whereas, the *User's Manual for RESRAD-BUILD Version 3* sets forth a renovation scenario using a volumetric source with additional inputs that further define the building. DHSS recommends the use of the inputs as recommended by the users guide for the renovation scenario or further justification as to why deviation from the users guidance is necessary.
3. Contamination of floor, wall, ceiling, or roofing materials should be considered when accounting for the parameter of Direct Ingestion. Materials contaminated with radionuclides, defined as the source in RESRAD-BUILD, may be physically contacted during routine maintenance activities and building renovation. DHSS recommends that a value for the Direct Ingestion Rate be derived by considering the total physical mass of the source and maintaining a mass balance with the erosion of the source.

### Section 3.4

4. DHSS agrees that the residential occupation of such a building without extensive renovation is unlikely, but SAIC gives little reasoning for this. DHSS recommends that the document discuss any zoning requirements, deed restrictions, or other limitations that may prohibit residential use of this property. Furthermore, DHSS recommends that the document briefly address the soil sampling conducted near the existing residential areas along the haul route and determine the potential of contamination for these structures prior to ruling out a residential scenario.

### Section 4.0

5. Table 3.1 in the *User's Manual for RESRAD-BUILD Version 3* lists the key parameters used in the building occupancy and building renovation scenarios. Only those parameters that would be different are listed. Other parameters are site specific or should be kept at RESRAD-BUILD defaults. DHSS recommends that the uncertainty analysis discuss the use of any parameters that vary from the default or the template data values in the RESRAD-BUILD calculation and what effect such values may have upon the calculated doses.

### Section 6.0

6. *Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario using Probabilistic RESRAD-BUILD 3.0 Code*, was incorrectly cited in this section and throughout the document as NUREG/CR-6697. The document should be correctly cited as NUREG/CR-6755.

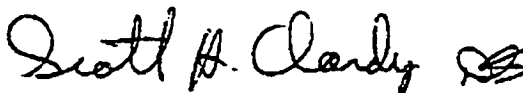
Eric Gilstrap  
December 23, 2003  
Page 3

### General Comments

7. This draft document did not mention analysis plans, site-specific radionuclide concentrations, criteria to determine remediation need, or a means to remediate the buildings. Will these items be forthcoming?

DHSS appreciates the opportunity to comment on this document. If you have any questions or concerns regarding this letter, please contact Daniel Creek at (573) 751-6160.

Sincerely,



Scott A. Clardy, Administrator  
Section for Environmental Public Health

Enclosure: Calculation Sheet for North County Structures DCGLs

SAC:GMC:DTC:amh

# North County Structure's DCGLs

Building Occupancy Scenario (Industrial Worker)

Year 1.0 DCGLs

BENCHMARK DOSE= 15 mrem/yr

RADIONUCLIDE / PROGENY		SOURCE (mrem) – based upon 1 pCi/m <sup>2</sup>					DSR SUBTOTAL	TOTAL DSR	SURFACE CONCENTRATION	Conversion	DCGLs Calculated by SAIC
		1	2	3	4	5		mrem/yr	BENCHMARK DOSE		
								pCi/m <sup>2</sup>	TOTAL DSR		
U-238	U-238	2.51E-05	4.99E-06	4.99E-06	4.99E-06	4.99E-06	4.51E-05	4.51E-05	3.33E+05	7323.53	19,000.00
	U-234	1.18E-10	2.36E-11	2.36E-11	2.36E-11	2.36E-11	2.12E-10				
	Th-230	2.03E-15	4.06E-16	4.06E-16	4.06E-16	4.06E-16	3.65E-15				
	Ra-226	3.14E-19	2.88E-20	2.88E-20	2.88E-20	2.88E-20	4.29E-19				
	Pb-210	3.51E-19	6.99E-20	6.99E-20	6.99E-20	6.99E-20	6.31E-19				
U-235	U-235	2.74E-05	5.28E-06	5.28E-06	5.28E-06	5.28E-06	4.85E-05	4.85E-05	3.09E+05	6798.88	16,000.00
	Pa-231	8.63E-09	1.72E-09	1.72E-09	1.72E-09	1.72E-09	1.55E-08				
	Ac-227	1.06E-09	2.11E-10	2.11E-10	2.11E-10	2.11E-10	1.90E-09				
U-234	U-234	2.78E-05	5.56E-06	5.56E-06	5.56E-06	5.56E-06	5.00E-05	5.00E-05	3.00E+05	6594.50	17,000.00
	Th-230	9.25E-10	1.85E-10	1.85E-10	1.85E-10	1.85E-10	1.67E-09				
	Ra-226	8.32E-14	7.65E-15	7.65E-15	7.65E-15	7.65E-15	1.14E-13				
	Pb-210	5.10E-16	1.01E-16	1.01E-16	1.01E-16	1.01E-16	9.14E-16				
PA-231	Pa-231	2.72E-04	5.44E-05	5.44E-05	5.44E-05	5.44E-05	4.90E-04	6.04E-04	2.48E+04	546.27	1,400.00
	Ac-227	6.37E-05	1.27E-05	1.27E-05	1.27E-05	1.27E-05	1.15E-04				
TH-232	Th-232	3.45E-04	6.90E-05	6.90E-05	6.90E-05	6.90E-05	6.21E-04	6.29E-04	2.39E+04	524.73	1,300.00
	Th-228	3.36E-06	6.07E-07	6.07E-07	6.07E-07	6.07E-07	5.79E-06				
	Ra-228	1.58E-06	1.32E-07	1.32E-07	1.32E-07	1.32E-07	2.11E-06				
TH-230	Th-230	6.86E-05	1.37E-05	1.37E-05	1.37E-05	1.37E-05	1.23E-04	1.23E-04	1.22E+05	2673.87	6,900.00
	Ra-226	1.19E-08	1.09E-09	1.09E-09	1.09E-09	1.09E-09	1.63E-08				
	Pb-210	1.06E-10	2.10E-11	2.10E-11	2.10E-11	2.10E-11	1.90E-10				
AC-227	Ac-227	1.30E-03	2.60E-04	2.60E-04	2.60E-04	2.60E-04	2.34E-03	2.34E-03	6.41E+03	141.03	400.00
RA-228	Ra-228	8.02E-06	6.69E-07	6.69E-07	6.69E-07	6.69E-07	1.07E-05	6.56E-05	2.29E+05	5027.73	7,700.00
	Th-228	3.19E-05	5.76E-06	5.76E-06	5.76E-06	5.76E-06	5.49E-05				
RA-226	Ra-226	1.83E-05	1.68E-06	1.68E-06	1.68E-06	1.68E-06	2.50E-05	2.56E-05	5.86E+05	12900.70	15,000.00
	Pb-210	3.12E-07	6.20E-08	6.20E-08	6.20E-08	6.20E-08	5.60E-07				

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Addendum to comments on the review of the draft document titled "Derivation of Site-Specific DCGLs for North County Structures: Rev. B2, October 29, 2003

Author/Originator

Eric Gilstrap

Company

MDNR

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12/30/2003

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Sharon Cotner

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