DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 LATTY AVENUE
BERKELEY, MISSOURI 63134

September 20, 2004

REPLY TO
ATTENTION OF:
Formerly Utilized Sites Remedial Action Program

SUBJECT: Response to Comments on the Derivation of Site Specific DCGLs for North County Structures, St. Louis, Missouri, Public Review Draft, dated June 25, 2004

Mr. Dan Wall
U.S. Environmental Protection Agency
Region VII, Superfund Branch
901 North 5th Street
Kansas City, Kansas 66101

Dear Mr. Wall:

Enclosed are the responses comments received on the subject document identified above. Copies of these comments and responses are also being provided to Mr. Robert Geller and Mr. Eric Gilstrap (Missouri Department of Natural Resources) and Mr. John Katkish (General Investiment Funds Real Estate Holding Company).

Sincerely,

Sharon R. Cotner
FUSRAP Program Manager

Enclosure

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ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 LATTY AVENUE
BERKELEY, MISSOURI 63134

REPLY TO
ATTENTION OF:

September 20, 2004

Formerly Utilized Sites Remedial Action Program

SUBJECT: Response to "RE: Comments on the Derivation of Site Specific DCGLs for North County Structures, St. Louis, Missouri, Public Review Draft, dated June 25, 2004"

Mr. Robert Geller
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102

Dear Mr. Geller:

Enclosed are the responses to the subject letter from Missouri Department of Natural Resources dated August 23, 2004, subject as above.

Copies of these comments and responses are also being provided to Mr. Dan Wall, U.S. Environmental Protection Agency, Region VII, and to Mr. Eric Gilstrap of your staff.

Sincerely,

Sharon R. Cotner
FUSRAP Program Manager

Enclosure

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
8945 LATTY AVENUE
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REPLY TO
ATTENTION OF:

September 20, 2004

Formerly Utilized Sites Remedial Action Program

SUBJECT: Response to Comments of General Investment Funds Real Estate Holding Company on the "Derivation of Site Specific DCGLs for North County Structures" (June 25, 2004)

Mr. John R. Katkish
General Investment Funds Real Estate Holding Company
3201 New Mexico Ave., NW, Suite 246
Washington, DC 20016

Dear Mr. Katkish:

Reference, letter, Wilmer, Cutler, Pickering Hale and Dorr dated August 21, 2004, Subject: "Comments of General Investment Funds Real Estate Holding Company on 'Derivation of Site Specific DCGLs for North County Structures' (June 25, 2004)" with enclosed letter from Foxfire Scientific, Inc., Subject: "Comments of Foxfire Scientific, Inc., on USACE's Public Review Draft 'Derivation of Site Specific DCGLs for North County Structures' (June 25, 2004)".

Responses to the referenced comments provided on your behalf are attached. Copies of these comments and responses are also being provided to Mr. Dan Wall, U.S. Environmental Protection Agency, Region VII, and to Mr. Robert Geller and Mr. Eric Gilstap, Missouri Department of Natural Resources.

Your participation in the CERCLA process for the St. Louis North County Sites, as documented in the comments provided, is appreciated.

Sincerely,

Sharon R. Cotner
FUSRAP Program Manager

Enclosure

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Major #1		The DCGL Report Fails to Identify Radionuclide Concentration Ratios. The DCGL Report does not address how the baseline radionuclide concentration ratios (used in the sum of ratios analysis) will be determined. This is important because invalid assumptions about these ratios could result in artificially (improperly) high DCGLs and, ultimately, a failure in fact to achieve the 15 mrem, unrestricted use remedial goal. While it may be appropriate to use the same set of radionuclide concentration ratios across all HISS VP structures, that decision would need to be supported by sufficient survey and laboratory characterization data from the affected structures. Alternatively, such characterization data could be used to develop building-specific concentration ratios (or if necessary, ratios specific to discrete areas of buildings). The DCGL Report does not show that such data has been collected, or if it has, the results of the Corps' analysis. The concentration ratios selected, and the laboratory and statistical analysis to support the selected ratios, should be published and made available for comment.	Due to variability of isotopic ratios across the North St. Louis County sites, isotopic ratios will be determined for each potentially contaminated structure or, alternatively, the most restrictive relevant DCGL will be used. (Thorium-230 is generally the limiting contaminant within much of the North St Louis County sites.) Information as to the isotopic ratio for a given structure or portion thereof will be stated in post remedial action reports and/or relevant final status survey reports.
Major #2		The DCGL Report Should Address the Relationship Between Dose Received From Sources Within Structures and Dose Received From Outside Soils. The DCGL Report is silent about doses to workers or residents from MED/AEC sources other than from the building surfaces considered in the Report (e.g., outside soils). To be sufficiently protective for CERCLA purposes, the cumulative dose received from both the exterior soils and building surfaces should not exceed the 15 mrem/yr. While time and motion study considerations may well determine that the 15 mrem/yr limit is not exceeded when these doses are summed, the DCGL Report should explicitly address the cumulative dose issue to demonstrate the protectiveness of the proposed DCGLs.	The dose from the residual contamination in the soil and the dose from the residual contamination on the structure will be calculated during the final site residual dose and risk assessment. The dose from both scenarios will be cumulative to demonstrate site compliance with 10 CFR 40, Appendix A, Criterion 6(6).
Major #3		Rule-Out of the Building Resident Exposure Scenario Is Not Adequately Supported. The Corps' modeling demonstrates that the "building resident" scenario would result in the most limiting DCGLs (i.e., lowest cleanup levels); however this scenario is dropped from the analysis and the final proposed DCGLs are instead based on the industrial worker scenario -- the next-most limiting scenario. While the industrial worker scenario should generate sufficiently protective DCGLs for the current commercial/industrial use of the 9150 Latty Avenue property and similarly situated properties, the building resident scenario would result in DCGLs 3 times lower than those	To assure that the industrial worker scenario is the most restrictive and appropriate for generation of DCGLS, each scenario was subjected to additional review. Conclusions with regard to removal of contamination coincidental to conversion of industrial structures to residential use were also reviewed. Review of parameters for each of the three scenarios resulted in the following additional information: Renovation Scenario: • Given that lifetime is directly related to the resuspension factor, air

Comments received: Foxfire Scientific, Inc.

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		proposed by the Corps. The building resident scenario is discarded by the Corps on the grounds that the renovations necessarily required to convert an industrial building to a residential use (or a use resulting in residential type exposures) would remove any contamination present. While this may be true, there is no evidence or analysis in the Report to support that conclusion, and therefore that conclusion can only fairly be viewed as mere speculation. This point is raised especially with respect to the assumptions that are made regarding doses during building renovation which appear to be inconsistent with taking credit for the removal of radioactive material during renovation. These assumptions are discussed in more detail below. The building resident scenario should remain part of the analysis or more defensible reasoning for screening it out without relying on an institutional control should be provided. See also our specific comments. below.	release fraction, removable fraction, building air exchange rate, and height, lifetime was determined to be 3280 days by using the assigned values used under renovation worker scenario. However, as a conservative approach, a value of 1825 days was assigned for lifetime. The value of 1825 days is within the range of 1000 to 100,000 days prescribed by NUREG-6697 and is appropriate without being excessively conservative. See also response to comment Major #8. • The air release fraction was adjusted pursuant to NUREG-6697 from 0.07 to 0.035 to account for the renovation related activities such as "mechanical disturbances that usually generate a relatively small fraction of particulates released to the air verses the amount that tends to fall to the floor and is subsequently removed by housekeeping activities". • The breathing rate of 33.6 cubic meters per day is adopted for consistency with the industrial worker scenario given that the breathing rate of 46 cubic meters per day was excessively conservative. The original value of 46 was based upon an outdoor breathing rate. A breathing rate of 33.6 is more consistent with an indoor rate such as that used in the industrial worker scenario. The breathing rate of 33.6 is based upon typical activities (including light, at rest, moderate, and heavy activities) as stated in the NRC's Data Collection Handbook. • The resuspension rate was selected based upon a maximum value listed in NUREG-6697. The resuspension rate of 1.7E-6 (Table 7.2-1 of NUREG-6697) was used in lieu of 1.4E-5. This value applies to "vigorous work including sweeping". Residential Scenario: • The source term is based on 80% of the pre-renovation source term that existed prior to renovation. Since the industrial buildings would require renovation prior to being used as a residence, the source term would necessarily be lower because the renovation reduced the source. Use of 80% is based upon the Renovation scenario lifetime of 1825 days (5 years) and exposure period of 365 days (1 year). (In addition, it is notable that use of 100% of the pre-renovation source term for the residential scenario results in retention of the industrial scenario as most restrictive.) • A value of 10% was used for the removable fraction pursuant to

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Foxfire Scientific, Inc.			
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			NUREG-6755 to minimize excessive conservatism. Industrial Worker: • Review of the input parameters indicates that no changes were necessary for the industrial worker. • Using a site-specific value of 20% is appropriately protective based on site empirical data. Comparison of the scenarios with the justified parameters demonstrates that the industrial worker scenario is the most limiting scenario with sufficient justification of parameters for all scenarios.
Major #4		Use of Industrial, Risk-Based Cleanup Standards Is Inconsistent With the Preferred Remedial Alternative. Both Alternatives 5 and 6 in the FS call for the removal of soils in currently accessible areas to "unrestricted use levels" in all parts of the North County Site and thus to "allow for unlimited use and unrestricted exposure" after cleanup is complete. The only exception to this standard discussed in the FS/PP was for currently "inaccessible areas" – which were to be made subject to institutional controls pending full remediation. The proposed DCGLs, however, are inconsistent with the "unrestricted use" remedial goal as the Corps only proposes to remediate structures to the extent protective to industrial workers. Presumably then, to assure the protectiveness of the remedy for CERCLA purposes, the Corps will have to place institutional controls on structures so remediated to prohibit non-industrial uses (at least until they are renovated and remediated in that context). The text of the PP provides that such controls are designed to give the government notice of planned activities in areas of residual contamination, "so that the government may conduct the necessary remedial action work prior to or in conjunction with the performance of" such activities. PP at p. 33. Accordingly, it remains necessary to develop DCGLs for the resident scenario to control the extent of the government's cleanup activities at such time as any affected building is used for non-industrial uses.	The benchmark dose is an unrestricted use standard, irrespective of whether the dose is the result of soils and sediments or structures or a combination thereof. Compliance with ARARs is protective under CERCLA. Thus, compliance with this ARAR results in a site that is appropriate for release for unlimited use and unrestricted exposure. Notably, remedial goals are based upon the most restrictive scenario and thus are protective for other scenarios such as the residential. Protectiveness will be documented by residual site dose and risk assessments that document achievement of the "highest potential TEDE within the first 1000 years to an average member of the critical group that would result from applying the limits on radium in soil, excluding the dose due to radon".
Major #5		The Exposure Calculations Fail To Consider Ingrowth Of Daughter Nuclides. As radioactive materials decay, some of the daughter materials are radioactive, and the total amount of radioactivity can actually increase with time. For this reason, when determining what *current* residual radionuclide concentrations will assure no *future* exposures greater than 15 mrem/yr, the	The USACE performed dose assessments using all radionuclides and fully considered ingrowth of daughters. Pursuant to the comment, USACE reviewed and verified the dose assessments to assure that all isotopes included all doses within a 1000 year period (radon dose excluded) to the average member of the critical group. This assessment determined the year of maximum exposure from

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		potential increases in dose associated with ingrowth should be considered. In contrast, the Corps has looked only at dose levels as of the time of cleanup and one year out (i.e., T=0 and T=1 year). See Table 3-1 and 3-2. These time periods do not account for ingrowth of daughter nuclides that could occur during the lifetime of the structures after the characterization surveys. Additional representative time periods should be included in the analysis, such as 5, 10, 15, 20 and 25 years, to fully account for ingrowth effects. See also our specific comments, below.	the sum of all radionuclides. Certain radionuclides (i.e., Th-232, Th-228 and Pa-231) had maximum doses at times other than the period during which the total dose was at its maximum. The prescribed DCGLs are those from the year of maximum total dose. To clarify that in the development of the DCGLs, all radioactive materials including daughters were incorporated into dose assessments, the text has been added in Section 3.3 as follows: "An assessment (for years 0, 1, 5, 10, 15, 20, 25, 30, and 1000) using all radionuclide contaminants of concern was performed to determine when the maximum dose would occur during the 1000 year period. The maximum exposure from the sum of all radionuclides occurred at year zero (0). Although certain radionuclides (i.e., Th-232, Th-228 and Pa-231) had maximum doses at times other than year 0, however, the prescribed DCGLs in this report are those from the year of maximum total dose (year 0). Given that the surface contamination is removed in the first 10,000 days, the remaining pathway after 27.4 years is limited to external radiation. Since the primary dose pathway is inhalation, doses after 10,000 days are not as significant as those in earlier years even when considering daughter ingrowth. It is notable that Th-232 is not a significant contaminant within the North St. Louis County sites, thus the dose associated with Th-232 and its daughter Th-228 is not a significant contributor to total dose. Also, Pa-231 is initially present in waste at 4.5% of the activity concentration of Th-230, thus it has limited dose implications as well." All isotopes will be fully and appropriately considered in residual site dose assessments. A DCGL will be specified for Th-228.
Major #6		The Corps' Dose Modeling Does Not Account For Typical Industrial Building Features and Could Understate Dose As A Result. The DCGL Report analyzed the dose from contaminated walls and the floor. The contamination (dust, dirt, grime, etc.) on these surfaces is the "source" being modeled and is a source of external dose as well as a source of particulates that can be inhaled should they become airborne or ingested. However,	The contamination on roof support structures, and other overhead infrastructure and equipment have been considered as part of the source term. The DCGL calculations fully and appropriately take account of these sources of dose in that the source term is effectively safe-sided by placing all of the source term in close proximity so that exposures are fully protective. To date, contamination found on North County structures has been very spotty and tightly adherent to the structure.

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		industrial buildings typically also have exposed ceilings, roof support structures, and other overhead infrastructure and equipment (such as light fixtures, pipes, conduit, structural framework, window ledges, etc.) that can collect surface contamination and become additional sources of dose in addition to floors and walls. For example, VP2L has all of these features. The DCGL calculations do not take account of these sources of additional dose and no justification for their exclusion is provided. Omitting these sources could result in an underestimate of dose, and insufficiently protective DCGLs. The DCGLs should be recalculated taking these overhead potential source areas into account. See also our specific comments, below.	To account for potentially contaminated areas, the entire floor and walls up to 2 m are assumed to be uniformly contaminated. Additionally, the size of the source terms used in this report is consistent to that previously approved by the NRC for the Windsor, CT FUSRAP site.
Major #7		The Corps' Modeling For the Building Renovation Scenario Understates Dose. For the Building Renovation scenario, the fraction of the contamination that is removable should be set higher than 0.2, or 20%. Although this value is the maximum recommended by both the DOE and the NRC in connection with normal building use, wear, and tear, they also recognize that there may be scenarios where the removal fraction is higher. Cleaning and demolition activities associated with renovation activities undoubtedly would result in a higher removal fraction than normal use, wear, and tear. The Corps makes essentially the same argument to justify both the higher resuspension rate for the Building Renovation scenario, and to discount (screen out) the building resident scenario as a likely scenario. We believe that the RESRAD-BUILD default value of 0.5 for the removable fraction is a more realistic and appropriate estimate.	At the time of document development, the NRC recommended a removable fraction value of 20% (NUREG-6697). Subsequently, in June 2003, the NRC revised the recommended removable fraction value to 10% (NUREG-6755). Using a site-specific value of 20% is appropriately protective based on site empirical data. Analyses in the report were adjusted consistent with this guidance and recommendations of the MDNR. See also response to comment Major #3.

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Major #8		The "Lifetime" of the Removable Fraction is Overstated In the Renovation Scenario Analysis. RESRAD-BUILD has an input called the removable fraction which determines how long it takes to finally remove all of the removable material. The source lifetime of 10,000 days, or over 27 years, used in the DCGL Report's building renovation scenario analysis, is logically inconsistent with other arguments in the draft DCGL report. If, as the DCGL Report argues, essentially all the contamination will be removed during the renovation to convert a building to residential use, then the source lifetime during renovation should be the same as the length of the renovation, or 365 days based upon the RESRAD-BUILD methodology for calculating dose. The longer lifetime" assumed in the DCGL Report for this scenario leads to an understatement of dose and artificially high DCGLs. See also our specific comments, below.	Upon further consideration, lifetime was adjusted from 10000 days to 1825 days. The value for lifetime for the renovation scenario when compared to related parameters should be 3280 (~10 years). However, as a conservative approach, this value was reduced to 1825 (5 years). The assumption with regard to removal of all of the source term pursuant to modification for use of industrial purpose as residential has been deleted from the report. See also response to comment Major #3.
Major #9		Th-228 Should Be Added To The List Of Radionuclides Analyzed. Thorium-228 is not included in the list of radionuclides assigned DCGLs. Given the presence of Radium-228, which decays to Ac-228 and then Th-228, it is essentially a foregone conclusion that Th-228 should be present. Given the historical nature of the contamination of the vicinity properties which allow for the ingrowth of Th-228 to have already occurred, quantities of Th-228 may be present that will not be accounted for by future ingrowth from Ra-228, especially given the evaluation times chosen in the draft DCGL report. This could result in an understatement of dose, artificially high DCGLs, and a failure to achieve the protective remedial objectives (i.e., failure of the remedy). Either Th-228 should be added to the list of radionuclides analyzed and the analysis repeated, or the Corps must articulate a reasonable rationale to justify its exclusion from the calculations.	Given that there are very low concentrations of Th-232 and its Th-228 daughter present within the North St. Louis County Sites, these radionuclides are not significant dose contributors. Nonetheless, a DCGL has been specified for Th-228. Further Th-232 and Th-228 will be appropriately incorporated in the site dose assessment. It is notable that Th-232 is not a significant contaminant within the North St. Louis County sites, thus the dose associated with Th-232 and its daughter Th-228 is not a significant contributor to dose. Pa-231 is initially present in waste at 4.5% of the activity concentration of Th-230, thus it also has limited dose implications. All isotopes will be fully and appropriately considered in residual site dose assessments.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

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Comment No.	**pp/§¶**	**Comment**	**Response**
Major #10		The DCGL Report Should Address Volume Contamination. The draft DCGL report restricts itself to considering contamination of building surfaces, however it may be possible for there to be some volume contamination. For example, the exterior walls of VP2L are of a sandwich construction with steel skins and insulation filler. At cracks and joints in the skin, it is possible for air permeation to lead to accumulation of dust and contamination in the insulation. Similarly, we understand that, in connection with a recent roof replacement project, such volume contamination was identified in the roof matrix of VP2L. While the dose from this contamination for an industrial worker is probably negligible, the potential dose to an unprotected renovation worker when the wall panels are demolished or the interior insulation is otherwise exposed could be significant and should be evaluated, particularly as the remedial goal is to achieve decontamination levels sufficient to allow unrestricted use and unrestricted exposure (i.e., after cleanup is complete renovation workers would not be on notice of the need to take prudent steps to protect themselves from such exposures). Consistent with the remedial objectives in the FS/PP, the potential for volume contamination of building components and any resulting impact on the DCGLs should be explicitly addressed, especially for the renovation scenario. In addition, the "Rationale For Building/Structural Cleanup and the Derivation of DCGLs at the North St. Louis County Sites" memorandum (which addresses surface contamination remedial techniques) should be revised to address how such volume contamination will be remediated.	With regard to volumetric contamination of roof components of VP-2L, it is notable that contamination was removable surface contamination that was subsequently encased by application of additional roofing over a roof surface that exhibited concentrations of radionuclides that exceeded background. FUSRAP contaminants generally do not have the ability to penetrate surfaces such that they are volumetrically contaminated. Contamination of insulation, if present, should be present on the outer surface of the material. This also represents the worst case with respect to potential for inhalation or ingestion of the associated contamination. As such, although use of volumetric sampling may simplify technical issues involved in the accurate measurement of contamination on the outer surface of insulation, surveys of insulation are not limited to volumetric sampling. Any issue not addressed by the ROD such as identification of volumetric contamination (if such is determined to exist) will be appropriately addressed pursuant to the CERCLA process.
Specific Comment #1	DCGL Report, Page 4, ¶ 2:	Expanding upon our general comment B(2), the reasoning given for including the building resident scenario in DCGL Report § 3.2 directly contradicts the reason given for screening this scenario out as a most limiting scenario to determine the DCGLs given in § 3.4. Either it needs to be considered as a potentially most limiting scenario or it does not. Additional justification for eliminating it from consideration should be provided.	To assure that the industrial worker scenario is the most restrictive and appropriate for generation of DCGLs, each scenario was subjected to additional review. See response to comment Major #3. Comparison of the scenarios with the justified parameters demonstrates that the industrial worker scenario is the most limiting scenario with sufficient justification of parameters for all scenarios.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Specific Comment #2	DCGL Report, Page 4, Final ¶:	The external gamma pathway is not independent of the contaminant nature. The removal of loose contamination reduces the external gamma dose in that it reduces the total amount of material present on the surfaces. While this does not affect the results, it is an incorrect statement.	The removal of loose contamination reduces the external gamma dose. However, the external gamma pathway is independent of the contaminant nature (i.e., loose or fixed). The receptor will receive an external gamma dose from either loose or fixed contamination.
Specific Comment #3.1	DCGL Report, Tables 3-1, 3-2,	Evaluation Times: Expanding upon our general comment No. B(5), the use of only time = 0 and time = 1 year does not allow for the ingrowth of daughter nuclides. These times are the RESRAD-BUILD default values and their use without evaluation of their applicability appears arbitrary. Foxfire Tables 1 and 2 below list the results for reanalysis of the industrial worker and renovation worker base cases as performed in the draft DCGL report but at additional evaluation times and with the addition of Th-228. The corresponding output files are contained in Appendices C and D. These tables give the annual dose in mrem per pCi/m2. As can be seen by the bolded cells, the maximum doses (and thus the minimum DCGLs) occur in years other than the ones analyzed in the DCGL Report for several radionuclides. Most importantly, the predominant contaminant of concern (COC), Th-230, has a maximum dose in a year other than year 0 or 1. For Th-230, the difference is minimal, but for other radionuclides, the difference is more than a factor of 3.	See response to comment Major #5.
Specific Comment #3.2	DCGL Report, Tables 3-1, 3-2,	Assumed Building Surface Dimensions. The room length, width, and height chosen for the RESRAD-BUILD model are more representative of a residence than a "commercial manufacturing facilities." Room area lengths and widths of 30m or more and wall heights of 6m or more are more representative of such buildings. However, it is recognized that the chosen room size is conservative in that it maximizes the source surface area to room volume ratio and thus maximizes inhalation doses. This room size also allows results in a single conservative model that is reasonably applicable to structures at all the vicinity properties, eliminating the need for building-specific analyses. This issue is raised only because it may matter with regard to the next comment.	Comment noted.

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Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Specific Comment #3.3	DCGL Report, Tables 3-1, 3-2,	Number of Sources: Expanding upon our general comment B(6), the roof interior/ceiling of a commercial manufacturing facility is typically open to the space below and thus presents a surface for dusts to settle out upon. Given the number of horizontal or near-horizontal surfaces associated with the structural framework of the roof, piping, conduits, light fixtures, and other overhead machinery at a typical industrial facility, there is a non-trivial fraction of the total ceiling area for dusts to accumulate and contribute to the overall dose to workers in the facility. Foxfire Table 3 below can be compared to Foxfire Table 1 above to illustrate the change in annual dose in mrem per pCi/m2. The corresponding output file is contained in Appendix E. In general, the dose increases by about 50% for each radionuclide. Changing the room height to a higher value may offset this to some degree at the risk of being less conservative with regard to inhalation doses.	See response to comment Major #6.
Specific Comment #3.4	DCGL Report, Tables 3-1, 3-2,	Source Locations And Source Area: If the wall heights and/or room area are changed, the impact on the source locations and total area must be considered. Report §3.3.1.1 bullet 4 states that the walls and floors are uniformly contaminated and also states that the walls are only contaminated up to a height of 2m of the total 2.5m of height. These two statements are contradictory. If the wall height is left the same, the wall source area should be changed to match the total surface area of the wall. The selection of a source vertical extent of 2m on a wall 2.5m high without explanation seems arbitrary. For conservatism, the contamination on the walls, and thus the area of the wall sources, should extend to a height of 2.5, increasing the total wall source area to 25 m2, an increase in area of 25%, which will also result in approximately a 25% increase in the dose due to the walls.	See response to comment Major #6. The assumption made in the modeling accounts for uniform contamination on the entire floor and the lower 2 m of 2.5 m walls.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Specific Comment #3.5	DCGL Report, Tables 3-1, 3-2,	Table 3-2, Removable Fraction: Expanding upon general comment B(7), for the Building Renovation scenario, the removable fraction should be set higher than 0.2. Although this value is the maximum recommended by both the DOE and the NRC, they recognize that there may be scenarios where the removal fraction is higher. Cleaning and demolition activities associated with renovation activities undoubtedly would result in a higher removal fraction than normal use, wear, and tear. This is essentially the same argument used by the Corps to justify the higher resuspension rate for the Building Renovation and also the same argument used to discount the building resident scenario as a likely scenario. If it is asserted that the act of renovating a commercial facility sufficiently to convert it to residential use will remove any contamination present sufficiently to justify excluding the residential scenario from further consideration, it must be acknowledged that that same renovation has the potential to generate substantial removable contamination during the course of the renovation. It is suggested that the RESRAD-BUILD default value of 0.5 or an even higher value is more appropriate. Foxfire Table 4 below gives the dose expected during renovation with a removal fraction of 0.5 mrem per pCi/m2. The corresponding output file is contained in Appendix F. As would be expected, the resulting doses increase by a factor of roughly 2.5 compared to those in Foxfire Table 2.	At the time of document development, the NRC recommended a removable fraction value of 20% (NUREG-6697). Subsequently, in June 2003, the NRC revised the recommended removable fraction value to 10% (NUREG-6755). Using a site-specific value of 20% is appropriately protective based on site empirical data. Analyses in the report were adjusted consistent with this guidance and recommendations of the MDNR. See also response to comment Major #3.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Specific Comment #3.6	DCGL Report, Tables 3-1, 3-2,	Table 3-2, Lifetime: Expanding upon general comment B(8) and similar to the argument in specific comment 3.5 above, if, as the Corps argues, building renovation will essentially remove all contamination, then the "lifetime" of the removable fraction should be equal to the length of the renovation instead of being 10,000 days, or over 27 years. The removable fraction lifetime should be set to 365 days to match the RESRAD-BUILD methodology used for calculating the dose during renovation activities. Foxfire Table 5 below gives the dose expected during renovation with a removal fraction lifetime of 365 in mrem per pCi/m2. The corresponding output file is contained in Appendix G. The resulting doses are an order of magnitude higher than the draft DCGL report's analysis of the renovation worker scenario. With this lifetime only the initial evaluation time of time=0 matters. Note: only the lifetime is changed from the base case in this analysis. Therefore, any effect from increasing the removable fraction would be in addition to the results below.	See response to comment Major #8.
Specific Comment #4	DCGL Report, § 3.3.4, Building Resident Scenario:	There are no specific comments for the building resident scenario. The modeling inputs are generally acceptable with the exception of source height on the wall, which should be addressed for this scenario as for the other scenarios. In addition, if the proposed changes to the renovation scenario are made, the renovation scenario will become the limiting scenario, which would also render moot the need for justification for screening out the building resident scenario.	See response to comments Major #3 and #6.
Specific Comment #5	DCGL Report, § 3.5, ¶ 1:	Given the suggested changes to the Renovation worker scenario, it is possible that different scenarios might be more limiting for different radionuclides depending on what changes are made and to what degree. This possibility should be explicitly considered or definitely ruled out.	Scenarios were reevaluated to assure that the industrial worker scenario was the most limiting. It was determined, after this reevaluation, that the industrial worker was indeed the limiting scenario. See response to comment Major #3.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Specific Comment #6	Exclusion of Volume Sources Not Justified.	Exclusion of Volume Sources Not Justified. The draft DCGL report restricts itself to considering contamination of building surfaces since there was no processing of materials within the vicinity property buildings and no activation of building materials. Building materials certainly were not activated, however it may be possible for there to be some volume contamination. Specifically, materials with large amounts of void space or very porous materials such as fiberglass insulation can effectively function as air filters if there is any air movement or currents through the material. For example, the exterior walls of the building on VP2L are of a sandwich construction with steel skins and insulation filler. At cracks and joints in the skin, it is possible for air permeation to lead to accumulation of dust and contamination in the insulation. The consideration of volume sources within the draft DCGL report is limited to an identical short statement in the parameter table for each scenario conveying the justification given at the beginning of this comment. While the dose from this volume contamination for an industrial worker is probably negligible, the potential dose to a renovation worker when the wall panels are demolished or the interior insulation is otherwise exposed should be evaluated. A similar situation could exist with regard to roof insulation or other roofing materials. It is recommended that the potential for volume contamination of building components and any resulting impact on the DCGLs be explicitly addressed, especially for the renovation scenario.	See response to comment Major #10.

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Comments received: Foxfire Scientific, Inc.			
Comment No.	**pp/§/¶**	**Comment**	**Response**
Specific Comment #7		The DCGL Report Provides Insufficient Detail To Confirm That The Most Limiting Scenario Has been Identified. Unless the dose from every individual radionuclide scales directly with Th-230, different scenarios could be limiting for different radionuclides, especially given that the industrial worker and building renovation scenarios are only a factor of two different for Th-230. In that event, the DCGLs may not be sufficiently protective. However, we are unable to confirm that the most limiting scenario has in fact been identified because detailed data is provided only for the industrial worker scenario, and only summary data is provided for the other scenarios. Compare DCGL Report Table 3-6 with DCGL Report Table 3-5. The details contained in DCGL Report Table 3-6 should be provided for all the relevant scenarios instead of the summary detail of DCGL Report Table 3-5 so that the public can comment on the analysis and confirm this point.	Given that contaminants other than Th-230 that exists on structures within the North St. Louis County Sites are a small fraction of the Th-230 activity, the use of Th-230 for determination of the limiting scenario is appropriate. All isotopes at their relative concentrations will be appropriately addressed in residual site dose assessments. The details for all relevant scenarios have been added to the report.
Specific Comment #8		The DCGL Report Provides Insufficient Basis For Certain RESRAD Input Parameters. Consideration should be given to using different values for some of the input parameters for the walls and floor (and ceiling/roof) sources. The resuspension rate, removable fraction and lifetimes could be significantly different for these different sources, with resulting significant differences in calculated dose and DCGLs. No justification is provided for why assigning the wall and floor the same removal rates is conservative beyond the simple assertion of that fact. Absent an articulated rationale, those conclusions could be viewed as arbitrary.	The rationale for input parameters is stated in the response to comment Major #3. Text has been added in Section 3.3 to further clarify when input parameters were adopted from regulatory guidance. See response to comment Major #3.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: Wilmer Cutler Pickering Hale and Dorr			
Comment No.	**pp/§/¶**	**Comment**	**Response**
A		**CRITICAL DATA AND ANALYSES HAVE NOT BEEN MADE AVAILABLE FOR PUBLIC REVIEW AND COMMENT** Foxfire's comments emphasize that there remains significant data collection and analysis to be completed before the truly "final" cleanup criteria can be identified, including that associated with developing (1) the radionuclide concentrations ratios to be used in the "sum of ratios" analysis, and (2) structure characterization data. In addition, although the Proposed DCGL document does not say so, we assume (perhaps incorrectly) that the figures representing the final DCGLs in fact mean some concentration or level of activity "above background," such that the net activity of even remediated structures may exceed the numerical DCGLs set forth in the DCGL Report. Even if DCGLs were calculated to theoretical perfection, the health protective aim of those standards could be lost and the remedial goal not achieved) if characterization, concentrations ratios, and/or background contaminant levels are not properly and accurately established. For this reason, in addition to the concentration ratio studies noted by Foxfire, the record needs to include studies that establish what the "background" levels of each of the relevant nuclides may be. In this regard, we find it hard to imagine that there is any measurable "background" level of Th-230 or other key site radionuclide contaminants in North County structures or soil (originating, as they did, from African and other exotic ores). Given the potential significance of these studies (and the inherent myriad professional judgments and statistical analyses they represent), we would have expected these important components of the remedial plan and goals to be addressed as part of the proposed DCGL review draft, but in any event, they should be made available for public review and comment in draft form. See 40 CFR 300.430(c)(ii)(A) (the lead agency's community relations plan should "[e]nsure the public appropriate opportunities for involvement in a wide variety of site-related decisions, including *site analysis and characterization*, alternatives analysis, and selection of remedy") (emphasis added).	All information required for development of final cleanup criteria have been available and were appropriately considered. See comment response to Major #1. Text has been clarified in Section 3.5 to state that the structure DCGLs are for concentrations above background for the site-specific materials as follows: "It is important to note that the DCGLs, when implemented during surveys, are to be compared to residual contamination above background. If background is not taken into consideration, the DCGLs remain fully protective." As a general rule, background for structural materials varies significantly based upon the specific material involved and is not significant relative to DCGLs. When required, background values are derived in accordance with procedures in final status survey plans and are beyond the scope of this document. (The soils background data set is in the Administrative Record. Mean background values for soils will be stated in the Record of Decision as determined in 1999.)
B		**DEMONSTRATION THAT THE 15 MREM REMEDIAL GOAL ADEQUATELY PROTECTS HUMAN HEALTH IS LEGALLY INSUFFICIENT UNDER CERCLA.** A key premise of the DCGL Report is that a 15 mrem annual dose adequately protects human health for purposes of satisfying the threshold	

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		CERCLA criteria set forth in 40 CFR 300.430(e)(9)(iii)(A). See CEMVS-PM-R, "*Memorandum for Record, Re: Rationale For Building/Structural Cleanup and the Derivation of DCGLs at the North St. Louis County Sites*" (Jul. 7, 2004) (the "*DCGL Rationale Memo*") (made available with the DCGL Report). As we understand this document, a 19 mrem standard, developed by the Corps using a dose assessment approach in relation to ARARs, was discarded in favor of the more protective 15 mrem standard to comply with EPA guidance "and to facilitate regulator acceptance."[2] That guidance, apparently OSWER 9200.4-18, "*Establishment of Cleanup Levels For CERCLA Sites With Radioactive Contamination*" (1997) provides that EPA does not consider ARARs with derived cleanup levels greater than 15 mrem/yr to be sufficiently protective to satisfy the requirements of CERCLA. By simply adopting the 15 mrem standard, the Corps has apparently understood this guidance to mean that a 15 mrem cleanup level would satisfy CERCLA protectiveness requirements where ARARs do not.[3] But this understanding is incorrect -- *15 mrem/yr is not a presumptive cleanup level under CERCLA*. Instead, the National Contingency Plan requires that a risk assessment approach (not a dose-based approach) must be used to set cleanup levels using the CERCLA carcinogenic risk range (generally 10^{-4} to 10^{-6}), with 10^{-6} as the point of departure and 1×10^{-6} used for PRGs. 40 CFR 300.430(e)(2)(i)(A)(*2*). EPA guidance makes these two points absolutely clear.	ARARs are considered protective. Protectiveness will be documented by residual dose and risk assessments.
		We concur with Foxfire's comments that a 15 mrem standard is protective of human health, indeed far more protective than a number of comparable protective standards set by federal and international agencies charged with protecting public health and only a fraction of the exposure U.S. residents receive from naturally occurring and other dispersed sources. However, we disagree with the Corps apparent view that its method of selecting a 15 mrem cleanup levels comports with the legal requirements of CERCLA. Since the proposed 15 mrem standard was adopted without consideration of the CERCLA risk range, and without justifying a departure from 1x10-6 risk, the Corps has failed to demonstrate the protectiveness of this standard to the extent required by CERCLA. This essential point was also raised in the July 2003 comments of Integrated Management and Environmental Solutions on the FS/PP (submitted with and incorporated by reference into GIFREHC's July 14, 2003 comments). While the different risk assessment	The use of the point of departure is appropriate for risk-based RGs when ARARs are not available. Under such circumstances CERCLA also defines the basis for moving off the point of departure. Their approaches are appropriate for development of RGs when ARARs are not available but are not employed when ARARs exist.

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		approaches (i.e., dose approaches, based on dose conversion factors, and the cancer risk approach, based on cancer slope factors) lead to differences in derived cleanup values, neither approach necessarily leads to more conservative cleanup values than the other and establishing cleanup levels based on cancer risk and the CERCLA risk range may not, in fact, lead to the selection of a different or more conservative standard. However, because the law appears to require setting cleanup levels using EPA's cancer slope factor approach and cancer risk ranges, we believe the Corps must complete the additionally required risk analysis and modify the ROD accordingly. A draft of that risk assessment should be made subject to public review and comment. (Superscript values indicate footnotes in original text.)	
C		**IT HAS NOT BEEN DEMONSTRATED THAT THE PROPOSED 15 MREM REMEDIAL GOAL SATISFIES ARARS.** The DCGL Rationale Memo confirms the Corps' position that 10 CFR Part 40, Appendix A, Criterion 6(6) is a relevant and appropriate requirement (ARAR). That regulation establishes a two-part cleanup standard. First, it requires that: [b]yproduct material containing concentrations of radionuclides other than radium in soil, and surface activity on remaining structures, must not result in a total effective dose equivalent (TEDE) exceeding the dose from cleanup of radium contaminated soil [equivalent to 40 CFR 192 cleanup standards for Ra-226 of 5 picocuries per gram (pCi/g) surface and 15 pCi/g subsurface, using modeling] (the benchmark dose) and we understand that the Corps has done extensive analysis is to show compliance with this benchmark dose. Second, however, this rule also requires that the TEDE "must be at levels which *are as low as is reasonably achievable*" (emphasis added) ("*ALARA*"). According to the Argonne National Laboratory, "ALARA" is best defined as, an approach to control or manage radiation exposures (both individual and collective to the workforce and the public) and releases of radioactive material to the environment as low as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit; it is a practice that has as its objective the *attainment of dose levels as far below applicable limits as possible*. (emphasis added)	An ALARA analysis had been completed upon derivation of the DCGLs. To assure completeness, this analysis is incorporated as an Appendix to the report. (This analysis documents that it is not appropriate to move off the designated DCGLs to lower concentrations pursuant to ALARA.) USACE concurs that ALARA is an integral component of the benchmark dose and that compliance with ARARs requires documentation that doses are ALARA. As such, ALARA is fully considered by USACE both during development of remedial goals and during implementation of the remedy. The ALARA analysis conducted in support of DCGL development has been incorporated as an appendix to this report. This analysis documents that it is not appropriate to further lower DCGLs pursuant to ALARA. Documentation of ALARA is also an integral component of residual site dose and risk assessments and will be incorporated into post remedial action reports for portions of the site that are remediated and into final status survey reports for areas not requiring remediation.

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		Absent from the DCGL Report is any analysis demonstrating compliance with the ALARA aspect of the ARAR. We would have expected an analysis of the social, technical, economic, practical, and public policy considerations that would prevent remediating North County Structures beyond the calculated applicable limit (whether 15 or 19 mrem) *to individual nuclide background levels*, particularly in light of the observation in the DCGL Rationale Memo that "the impact of the cost of the overall project due to the DCGLs based on 15 mrem per year [vs. 19 mrem/yr] is not anticipated to be significant due to the small number of structures likely to be impacted." In any event, it appears that the proposed DCGLs have not been demonstrated to satisfy the ALARA component of this ARAR as required by 40 CFR 300.430(e)(9)(iii)(A). The DCGL Report should be modified to include that analysis, and the related modeling constrained to any cleanup level below 15 mrem that is reasonably achievable.	
D		**DEFICIENCIES IN THE DCGL ANALYSIS REQUIRE THAT IT BE REPEATED AFTER ISSUES ARE CORRECTED** Wholly aside from the foregoing legal considerations, Foxfire's review of the DCGL Report has identified a number of deficiencies in the supporting analysis and methodology. The issues identified include: • Failure to provide a sufficient justification for ruling-out the "building resident" exposure scenario; • Failure to consider ingrowth of certain daughter nuclides; • Failure to account for typical overhead features of industrial buildings in the modeling; • Failure to include Th-228 in the analysis; • Failure to address volume contamination; and • The use of certain unreasonable and/or unsupported modeling input parameters in the "building renovation" scenario resulting in a significant *understatement* of dose and inappropriately high DCGLs. Foxfire has performed its own RESRAD-BUILD analysis in respect of certain of these matters to show that individually and in the aggregate, they will materially effect the outcome of the analysis, and therefore that, among	Each of Foxfire's comments has been addressed individually earlier in this response to comments. Foxfire's comments do not materially affect the outcome of the analysis.

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		other things, the analysis and modeling should be repeated after the deficiencies are corrected.	
E		**THE ROD NEEDS TO ADDRESS ALL ASPECTS OF CONTAMINATED STRUCTURES** The remedial goal outlined in the FS/PP was remediation sufficient to "allow for unlimited use and unrestricted exposure" to contaminated *soils and structures*[5] – goals GIFREHC strongly endorses. As the Rationale Memo details, the FS suggested that structures would be remediated;[6] however, as noted above, the FS/PP addressed only specific remedial goals and remediation approaches for soils -- not buildings. Although the DCGL Report was apparently intended to fill this gap by addressing remedial standards for buildings, the underlying DCGL modeling appears concerned only with *indoor* surface contamination and *indoor* exposures. This focus raises questions about the Corps' intentions (and the content of the ROD) in respect of other aspects of structures – exterior surfaces and interstitial spaces. 1. <u>Remedial Plans With Respect To Exterior Surface Contamination On Structures Should Be Clarified.</u> The DCGL Rationale Memo expressly notes that the potentially contaminated North County structures to be addressed include exterior surfaces of structures, including: buildings and portions of buildings, including roof areas and foundations; footings, retaining walls, and stop logs; piping and ducting; utility poles; bridges and supporting structures; pavement; consolidated material to be left in place, and other similar items where surficial contamination is of concern. DCGL Rationale Memo ¶ 7; DCGL Report §1.2. The DCGL Rationale Memo also details a number of such outdoor features on VP2L and other VPs where such contamination has been confirmed (at some level). DCGL Rationale Memo ¶ 3. This basis, coupled with the fact that only one set of nuclide-specific DCGLs were developed and proposed, appears to confirm that the same remedial criteria will be applied to both interior and exterior	The Record of Decision will clearly reflect that structure DCGLs apply to all surfaces of impacted structures that are not in direct contact with inaccessible soils.

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		surfaces. The ROD should expressly state this. 2. Assumptions Regarding Volume Contamination Unsupported. The proposed DCGLs were calculated based on the premise that North County Structures would have only surface contamination. See, e.g., DCGL Report §2.1[7] and Tables 3-1, 3-2 and 3-3.[8] That premise is contradicted by the facts. As Foxfire points out in its report, volume contamination has been identified in roof components of VP2(L) and may exist in other areas of VP2(L) and the other VPs, such as in interstitial wall spaces (in insulation). The Corps' further site characterization activities must include investigation of these potential volume source areas, and they should be taken into account in the exposure modeling – particularly in regard to renovation scenarios – and remedial planning. (Superscript values indicate footnotes in original text.)	See comment response to Major #10.
F		**CLARIFICATION NEEDED REGARDING POTENTIAL DEVELOPMENT OF OTHER DCGLS** Section 3.1 of the DCGL Report states that "[o]ther DCGLs may be developed by the use of contaminant-to-dose ratios." This statement should be clarified, as it appears to be a placeholder, reserving the right of the Corps to develop additional or different DCGLs in connection with North County structures that will not be made subject to public comment. No explanation is given regarding what structures (or portions thereof) would be subject to such new/additional DCGLs, or what events would trigger the Corps opportunity to develop such DCGLs. We believe this is inappropriate and that all cleanup standards should be developed up front and following public review.	The cited text has been deleted.
G		**OBJECTION TO USE OF INDUSTRIAL CLEANUP STANDARDS FOR STRUCTURES** As noted above, the remedial goal outlined in the FS/PP was remediation sufficient to "allow for unlimited use and unrestricted exposure" to contaminated soils and structures. To this end, risk assessment with respect to the North County soils was based on a residential scenario. As noted in Foxfire's comments, the Corp has broken with that approach with respect to	See comment response to Major #3.

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		the DCGLs for structures by deriving the present cleanup levels from an industrial worker dose scenario on the theory that (1) such buildings are unsuitable for residential use, and (2) any renovations would cause the removal of any contamination – presumably to levels protective of human health in a residential setting. GIFREHC strongly objects to this rationale and approach for a number of reasons: • It is inconsistent with the stated purpose of the DCGLs and the remedial goals articulated in the FS/PP. The DCGL Report states, in §1.1, that, "[t]he use of the DCGLs specified herein for structures is protective under the Comprehensive Environmental Restoration Cleanup Liability Act (CERCLA) *for all scenarios to include residential.*" Use of industrial standards seems to belie this statement. The Corps' DCGL residential exposure scenario modeling demonstrates that affected structures currently used for commercial/industrial uses could not be "safely" used (consistent with CERCLA protectiveness standards) for residential purposes until further remediation beyond that contemplated by the DCGLs has been completed, and therefore, neither the uses or exposures would be "unrestricted."	While it is commonly perceived that residential scenarios are the most limiting, other scenarios are the most limiting for the North St. Louis County Sites for both soil and structures. Attainment of the RGs specified in the ROD will result in achievement of a site that is appropriate for unlimited use and unrestricted exposures (except, potentially, in inaccessible areas). Protectiveness will be demonstrated through achievement of ARARs and associated residual site dose and risk assessments.
		• It is inconsistent with the approach taken with respect to North County soils, for which remediation to levels safe for residential use was the preferred remedy for all areas whether or not the Corps deemed them currently "suitable" for residential use. The DCGL Report provides no justification or rationale for this change of position or use of different risk assessment approaches between soil and structures. Nor was this dual approach forecast to the public in the FS/PP.	The approach taken with respect to North County soils, was to assess the various scenarios and use the most limiting scenario to derive the soil RGs. The same approach was used during derivation of the structure DCGLs. See comment response to Major #3.
		• The logic for excluding the residential scenario is flawed. There is no evidence or analysis demonstrating (1) the extent of any renovation necessary to convert North County industrial buildings to residential uses, or other uses that would involve nonindustrial exposures (e.g., exposure to children rather than adults if large spaces are converted to, for example, day care uses or commercial indoor recreation facilities); or (2) that any such renovation would necessarily remove contamination to "residential" levels. Short of remediation to "residential" levels upfront, the only way to assure that cleanup during renovation is completed to "residential" levels is through institutional controls, but the DCGL Report states that the Corp will not use institutional controls in connection with structures. See DCGL Report §1.1 ("USACE is not planning on implementing any ICs for structures at the NC	See comment response to Major #3. Notably, if 100% of the source term is applied to the residential scenario, the industrial worker is still the most limiting. Text quoted, although not present in §1.1 of the report, was located in §3.3.4. This text has been deleted. Removal of contamination to the stated DCGLs achieves unrestricted use and unlimited exposure conditions such that

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		site"). As articulated by the DCGL Report, the Corps' analysis and plans fail to assure long-term effectiveness of the remedy at affected North County structures. • The rationale for excluding the residential scenario is incomplete. To suppose that renovation will remove contamination only begs the questions of (1) who (if anyone) would manage contaminated debris at the time of renovation; (2) where that contamination will come to be located; and (3) who may be exposed to it at its new location, and at what dose. Renovations may be taken without care, and contaminated building materials may be recycled into new structures or improperly disposed. No analysis (e.g., using RESRAD-RECYCLE) has been done to show what dose on or offsite persons may encounter from such materials. No provision is made to assure the adequacy of that cleanup. The proposed DCGLs fail to assure the short-term and longterm effectiveness of the remedy at affected North County structures. • The rationale for excluding the residential scenario is unsubstantiated and legally insufficient. The Corps generally cites "municipal zoning restrictions, the need for occupancy permits, and FAA surface use restrictions" to further support its exclusion of residential uses from the DCGL analysis. First, the DCGL Report does not identify the specific applicable zoning rules, permitting rules, or FAA surface use restrictions upon which it relies and therefore it is impossible to say what any such rules in fact prohibit. Second, each of the noted rules is in fact a form of institutional control, but insufficient for that purpose as without a means for the USACE, EPA or other agencies charged with protecting *public health* to enforce them – and the Corps has indicated that it will not use institutional controls for structures. The "building resident" scenario should be returned to the analysis and, if it remains the most limiting, it should form the basis for the DCGLs.	institutional controls are not required. See also comment response to Major #3. See comment response to Major #3. Residential scenario assumes that only 20% of the source term is removed during renovation, due to increased removable fraction and air release fraction not the removal of contaminated debris. The most limiting scenario has been used in establishing the structure DCGLs. The industrial scenario is the most limiting scenario. Dose to on-site personnel from renovation was considered in the renovation worker scenario. Dose to off-site personnel (e.g., renovation handling, transport, disposal, etc.) was considered and was not the limiting scenario. The following text was added in Section 3.2 to the report to show these considerations: "Additional receptors associated with the renovation scenario (i.e., those listed in NUREG-1640, handling, transportation, disposal, etc.) were also considered. The dose to source (DSR) ratios for North County's predominant contaminant of concern, Th-230, for the additional receptor scenarios (NUREG-1640) when compared to the DSR of the most limiting scenario identified in this report were found to be less limiting as shown in Table 3-6." See comment response to Major #3. The building resident scenario has been analyzed and is not the lost limiting scenario and is not, therefore, the basis for the DCGLs.

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H		**PARTIAL RENOVATION SCENARIO** As we understand the DCGL modeling that was conducted in respect of renovation workers, it was assumed that a full renovation of an affected building would be conducted. In fact, the experience at VP2(L) indicates that the more likely short-term scenario is a partial renovation or series of maintenance events (e.g., the recent roof replacement project at VP2(L), renovation of office areas only, installation of HVAC equipment, lighting or other facilities systems, or the reconfiguration of industrial areas or installation of new equipment. Analysis should be conducted to assure that any dose associated with multiple partial renovations would be bounded by the other scenarios studied, and that a partial renovation would not represent a more limiting case.	The length of time that a renovation worker is exposed to contaminants during renovation (90 days or 720 hours per year) is consistent with the construction worker scenario in the North County FS. This time period allows for complete renovations as well as multiple partial renovations The renovation scenario is based on the existence of the source term within the stated small area and thus is protective for partial renovations. See comment response to Major #6.
I		**THE FINAL DCGL SUPPORT DOCUMENT AND THE ROD SHOULD BE CLEAR ABOUT THE EXTENT AND PRACTICAL EFFECT OF THE REMEDIATION THAT WILL BE ACHIEVED.** As we understand the FS/PP and the DCGL Report, the Corps remains committed to remediation sufficient to "allow for unlimited use and unrestricted exposure" to (currently) contaminated soils and structures. We believe this approach is the only approach that has any broad community acceptance, and, as noted elsewhere, it is the approach that GIFREHC strongly endorses. But the modeling and the articulated rationale supporting the proposed DCGLs suggests some retreat from this protective approach, particularly as a result of the reliance on industrial exposure standards and the failure to clearly address all components of structures, as discussed elsewhere in these comments. Regardless of how these other issues are finally resolved in respect of the DCGLs, the final DCGL support document and the ROD should state clearly and unequivocally that, once characterized and cleared and/or remediated, all potentially contaminated North County structures (and soils) (excepting only those "inaccessible areas" expressly made subject to enforceable institutional controls) will be subject to no restrictions whatsoever, including any further need: (a) to investigate potentially contaminated structures prior to renovation or maintenance work; (b) to provide renovation or maintenance workers with personal protective equipment or to follow special work procedures in respect of potential	See comment response to Major #2. USACE RGs represent unlimited use and unrestricted exposure concentrations such that institutional controls will be appropriate only for inaccessible soils exceeding RGs and the CERCLA risk range.

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		radiation exposure; or (c) to employ any special or restricted management or disposal of building debris (or soils) generated in connection with North County VPs. This is the implied promise of the Corps' "unlimited use and unrestricted exposure" benchmark, although we have not seen it articulated in this direct, practicable manner. If this is not what the remediation will achieve, the public should be alerted to these ongoing requirements.	
J		**REEMPHASIS AND INCORPORATION OF CERTAIN PRIOR COMMENTS.** In its July 14, 2003 comments on the FS/PP, GIFREHC raised a number of comments with respect to *soil* remediation issues that are equally applicable with respect to characterization and remediation of North County *structures*. Rather than repeat those comments at length, GIFREHC incorporates those comments by reference, including: • §A - ROD Does Not Supplant Prior Agreements Between the United States and GIFREHC; • §B - GIFREHC Supports A Removal Alternative To Achieve Unrestricted Use; • §D - VP2(L) Should Be Remediated First Among the VPs, and this Determination Should be Reflected in the ROD; • §G - Final Status Surveys and Other Cleanup Documentation; • §H - Institutional Controls and Long -Term Stewardship; • §I – Implementation; and • The comments of IMES (incorporated by reference into GIFREHC's July 14, 2003 comments).	Comment noted.
K		CONCLUSION GIFREHC strongly supports the proposed Remedial Action Objectives and remediation goals that, when achieved, will "allow for unlimited use and unrestricted exposure." The ROD should reflect the commitment today to achieve that standard for all North County properties and structures, and include requirements for appropriate short term protective measures, post-remedial documentation, and long term stewardship to assure that the North	USACE acknowledges and appreciates GIFREHCs support.

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Comment No.	**pp/§/¶**	**Comment**	**Response**
		County community and affected property owners obtain the full benefit intended benefit of the proposed action.	

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: MDNR			
Comment No.	**pp/§/¶**	**Comment**	**Response**
1		To adequately assess the risk to human health, the department recommends a risk-based approach to calculate preliminary remediation goals for each radionuclide. Clean up, if necessary, should achieve a cumulative risk within the 1.0×10^{-4} to 1.0×10^{-6} carcinogenic risk range, based on reasonable maximum exposure. The contamination of the North County Structures poses building surface contamination scenarios. Currently the U.S. Environmental Protection Agency (EPA) has not published guidance to develop risk-based corrective action for such interior surficial contamination. Therefore, the department concurs that this situation may be best assessed using RESRAD-BUILD.	Your concurrence with the use of RESRAD-Build is acknowledged and appreciated.
2		When using RESRA-BUILD, it is important to consider that using a benchmark dose of 15 mrem/year correlates to a total excess carcinogenic risk of 3.0×10^{-4} . The EPA has concluded that this should be the maximum dose limit for humans. With regard to this document, the department wishes to reiterate its December 23, 2003, comments concerning the use of the template data values. The use of the template data values provides for calculated Derived Concentration Guideline Levels (DCGLs), representative of a reasonable maximum exposure when using a dose level that slightly exceeds the normally acceptable risk range of 1.0×10^{-4} to 1.0×10^{-6}. With this in mind, please consider the comment below: 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 the Missouri Department of Health and Senior Services, a representative of Argonne National Laboratory recommended the use of these template data values. Therefore, the department recommends the values of 0.357 for the Air Release Fraction and 0.1 for the Removable Fraction be used in the building occupancy scenario.	See comment response to Major #3. Additionally, it is notable that independent technical reviewers from Texas A&M University found no objection to use of the cited parameters. As noted in response to comment Major #3, the removable fraction was changed to 0.1 for the building resident scenario. Other changes are also as noted in response to comment Major #3.
3		The department would like to thank the USACE for the extended time granted for the public review of this document. We request opportunity to	MDNR is being provided a copy of the public comments and responses.

COMMENTS AND RESPONSES ON THE DERIVATION OF SITE-SPECIFIC DCGLS FOR THE NORTH COUNTY STRUCTURES ST. LOUIS, MISSOURI (JUNE 25, 2004)

Comments received: MDNR			
Comment No.	**pp/§/¶**	**Comment**	**Response**
		participate in responding to any public comments that are submitted to the USACE during this review. Public comment on these :ssues is important to both the USACE and the department.	

FUSRAP Document Management System

Year: 00 | ID: 4436

Further Info? ☐

Operating Unit: North County | Site: | Area: | MARKS Number: FN:1110-1-8100g

Primary Document Type: Site Management | Secondary Document Type: Correspondence

Subject or Title: Response to comments on the derivation of site specific DCGLs for North County structures, St. Louis, MO, Public Review Draft, dated June 25, 2004

Author/Originator: Sharon Cotner | Company: FUSRAP | Date: 9/20/2004

Recipient (s): Dan Wall; Robert Geller | Company (-ies): USEPA; MDNR | Version: Final

Original's Location: Central Files | Document Format: paper | Confidential File? ☐

Include in which AR(s)?

- ☑ North County
- ☐ Madison
- ☐ Downtown
- ☐ Iowa

Comments:

SAIC number:

Bechtel ID:

ETL: ~~0101~~ 4.0

Filed in Volume: 01