UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

FEB 02 2012

Ms. Sharon Cotner
FUSRAP Program Manager
St. Louis District United States Army Corps of Engineers
8945 Latty Avenue
Berkeley, Missouri 63134

Re: The EPA Comments on the Inaccessible Soils Remedial Investigation, St. Louis Downtown Sites, Operable Unit 2, St. Louis Airport Superfund Site, St. Louis, Missouri

Dear Ms. Cotner:

The U. S. Environmental Protection Agency has received the document entitled "Radiological Survey Plan for Futura Building Structures, Revision B" by Shaw the U.S. Army Corps of Engineers, St Louis District, as a part of the Formerly Utilized Sites Remedial Action Program. This document was dated November 22, 2011, and received on November 25, 2011.

The EPA makes the following general comments for the remedial investigation:

1. The Army Corps of Engineers and its contractors are to be commended for taking a mountain of data and processing it into a useful form. However, it is clear from the numerous factual, mathematical and stylistic errors populating the appendices that one more cogent editing of the RI is necessary before it can stand as an acceptable basis for making a decision. Appendix I stands as a model of completeness of mathematical processes and of clarity of presentation. By contrast, appendices B, E, F and M contain multiple examples of factual and mathematical errors and presentational slovenliness. The author of appendix I should be tasked with revising these appendices and bringing them up to an acceptable standard.

2. In multiple places in this RI report, the reader is referred to the RI Work Plan for further details, methods and/or procedures. This is not acceptable. The ISOU RI Report should be comprehensive to include all methods and procedures such that referring to separate documents is not necessary. Many of these specific inadequacies are noted in the technical comments below. Please ensure that this RI report is comprehensive to provide all necessary information.

3. The document does not follow the 1998 EPA Ecological Risk Assessment guidance entitled "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments." A Screening Level Ecological Risk Assessment needs to be performed according to the 1998 EPA guidance or an explanation in the text of why the screening level was not performed.

4. The document does not follow the EPA guidance in several key areas:

   a. The RI report does not evaluate potential risks to human health from radiological contaminants using the EPA risk assessment guidance. Rather, the report uses the U.S. Department of Energy's RESidual RADioactivity (RESRAD) computer code to evaluate potential risk from radiological contaminants. Unfortunately, this issue is not unique to the St Louis Downtown Sites. Rather, it is an issue that has been frequently raised at former Department of Energy sites around the country.

   b. The EPA risk assessment guidance recommends screening contaminants for inclusion in the risk assessment using a 1E-06 potential excess cancer risk. This document uses a 1E-05 potential excess cancer risk.

   c. The document also screens contaminants using a dose limit of 25 mrem/year. The EPA has taken the position that a dose of 25 mrem/year is not sufficiently protective (per the 1997 EPA guidance "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination. OSWER Directive No. 9200.4-18") and has recommended that a maximum dose of 15 mrem/year be used instead.

The EPA has the following technical comments:

5. Section 2.1, paragraphs two through four, and table 2-1: This section is not clear. The text describing PCOCs does not match with the constituents listed in table 2-1, at least not directly. Or perhaps, paragraph four is prematurely placed in this discussion. If the final list of PCOCs is presented in paragraph five, please rearrange this text so table 2-1 (and paragraph four) follows that information. Also, table 2-1 would be more easily understood if there were separate columns for PCOCs in soil and in sediment. It appears that contradictory information is presented in paragraphs three and four. For example, the last two sentences of paragraph three indicate that metals for soil were refined to As, Cd and U-metal. However, the last sentence of paragraph four indicates those three metals plus Co, Cu, Pb, Mn, Mo, Ni, Se, V and Zn. U-metal is not included in that last list. Please revise this section for clarity.

6. Section 2.2.1, paragraph two and figure 2-1: Looking at figure 2-1, there is a note discussing a downward sloping of the inaccessible soil away from the structure foundation. This implies that inaccessible soil may extend beyond the five-foot distance, even though the text specifically describes inaccessible soil as five feet on the horizontal. Please clarify in the text this sloping away from the structure and whether the five-foot distance may be exceeded or not.

7. Section 2.2.1, paragraph two and figure 2-2: Similar general comment as 2, but for the road bed.

8. Section 2.2.1, paragraph two and figure 2-3: Similar general comment as 2, but for the rail bed and a ten-foot distance.

9. Table 2-2, footnote b: It would appear that the reference to the RI WP here is unnecessary. Recommend deleting "As described in the RI WP." Either refer to another section of the ISOU RI

or, if more information is required as to the nonimpacted areas, please provide it in the text rather than referring to a separate document.

10. Section 2.2.3, paragraph three, first sentence: Please do not refer the reader to the RI WP for methods and procedures for field activities. All methods and procedures should be presented in this ISOU RI Report. Please revise the report as necessary.

11. Section 2.2.3, Manhole Sediment Sampling, last sentence: Please revise "soil boring logs" to either "sewer sediment manhole logs" or "sewer soil boring logs."

12. Section 2.2.3, Soil Boring Sampling Adjacent to Sewers, paragraph three, first sentence: Stating that "Some modifications were made to the soil sampling approach outlined in the RI WP" implies that the soil sampling approach is not provided in this ISOU RI Report. Please ensure that the soil sampling approach is presented in this ISOU RI Report.

13. Section 2.2.4, paragraph one, first sentence. Stating that "...QA/QC samples were obtained and analyzed in accordance with the RI WP" implies that QA/QC sampling and analytical requirements are not presented in this ISOU RI Report. Please ensure that all QA/QC requirements are presented in this ISOU RI Report and that there is no need to refer to a separate document.

14. Section 2.2.5, paragraph one, first sentence: Please ensure that all equipment decontamination procedures are included in this ISOU RI Report and that the reader does not need to refer to a separate document. Revise the report as necessary.

15. Section 2.2.5, paragraph one, third sentence: What is "chemical sampling"? Are chemicals being sampled, or instead, are environmental media (soil, sediment, etc.) sampled for chemical analysis? Please revise the report for clarity.

16. Section 2.2.5, paragraph two, first sentence: Please see technical comment 15, except this is in reference to "radiological sampling." Please revise the report for clarity.

17. Section 2.2.5, paragraph three, fourth sentence: Instead of referring the reader to the SAG to know what the "unrestricted use" contamination levels are for deconned equipment, please revise the report to present those levels in the ISOU RI Report.

18. Section 2.2.6, third sentence: Please ensure that methods and procedure related to the management of IDW are included in this ISOU RI Report and that the reader does not need to refer to the SAG.

19. Section 4.1, paragraph two, first sentence: "Screening levels are health-based for radiological and metal PCOCs. Radiological screening levels are dose-based and metal screening levels are risk based." What does this mean? For clarity, please elaborate.

20. Section 4.1, table 4-1. This table provides the screening level concentrations used to identify chemicals of potential concern. For several compounds, the screening level concentration exceeds the recommended screening levels derived using the EPA's radiological PRG calculator, which can be found at http://epa-prgs.ornl.gov/radionuclides/, as well as the EPA's regional screening table for

metals, which can be found at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm. Because several of the screening levels are higher than what the EPA recommends, it is possible for some areas with relatively low levels of contamination to be excluded from the risk assessment. The following table identifies those contaminants with elevated screening values, as shown in table 4-1 of the report. Note that the EPA screening values are based on an excess potential cancer risk of 1E-06:

Ra-226	5 pCi/g	2.48E-02 pCi/g	2.78 pCi/g
Ra-228	5 pCi/g	5.38E-02 pCi/g	0.95 pCi/g
U-238	50 pCi/g	1.65 pCi/g	1.44 pCi/g
Arsenic	60 mg/kg	1.6 mg/kg	21.76 mg/kg

21. Section 4.1, paragraph two, first sentence: "Screening levels are health-based for radiological and metal PCOCs. Radiological screening levels are dose-based and metal screening levels are risk based." What does this mean? For clarity, please elaborate.

22. Section 4.1.1, last paragraph: Rather than refer the reader to the RI WP, please provide the DCGL calculation process for structure surfaces in the ISOU RI Report. An appendix will suffice, is applicable.

23. Section 4.1.1, paragraph one, last sentence: "....demonstrated protectiveness of the 50 pCi/g standard." A literature citation must be provided for this assertion.

24. Section 4.1.1, paragraph three: This subsection mentions DCGLs derived from gross alpha measurements of radioactive material on building surfaces. That is confusing since DCGLs are radioisotope specific and gross alpha measurements are not radioisotope specific in principle. Furthermore, DCGLs are for internal dose calculation. How does this report get from building surface contamination measurements to DCGLs? This is particularly difficult since section 4.2.1 states that radium-containing pitchblend ores were processed from 1942-1945. These West-African ores were geologically old and contained many daughter isotopes in secular equilibrium. Therefore, the measured alpha particles could have come from any of a dozen or more isotopes in the uranium and thorium decay chains. So how do these gross alpha measurements translate into isotope specific alpha values? The authors must assume some radiosotope speciation; but, what and where is that information derived from? Footnote i in table 4.1 states that the methods of deriving DCGLs is found in appendix B of the RI WP. This methodology should be set forth somewhere in the RI, probably in an appendix so it can be reviewed. The reader should not have to chase down other documents in order to find the relevant technical methodologies for critically important calculations.

    Furthermore, since there is no external dose from alpha particles, how do the authors get from contamination on the building surfaces to internal dose? They must assume that some fraction of the surface contamination is inhaled and/or ingested, but what are the assumed inhalation and ingestion fractions? Finally, where are the example calculations to demonstrate the methodology for these dose contentions? This RI needs a full set of start-to-finish example calculations from one real and significant measurement. The example calculation should set forth the relevant methodologies, with literature citations, to demonstrate that the complicated processes of going from gross alpha surface

measurements to DCGLs to internal dose are founded on legitimate methodologies and correct mathematical manipulation.

25. Section 4.1.2, paragraph one, second sentence: Until this point in the RI, the uranium PCOC in soil was referred to as "uranium metal." Here the term used is "elemental uranium." Please revise the report to use the same term throughout the report for consistency.

26. Section 4.1.2, paragraph one, last sentence: Please add the reference for the 1988 FS for industrial workers by inserting "(USACE 1998b)" at the end of the sentence.

27. Section 4.1.2, paragraph two, last sentence: Please define "RG" if it is used here for the first time.

28. Section 4.2, last paragraph, second sentence: Table 4-2 is referred to here, saying that it presents radiological "COC" data. However, the table heading indicates "PCOCs." Please revise either the text or table as appropriate.

29. Section 4.2.1.1, paragraph three, fourth sentence: Rather than refer the reader to the RI WP, please summarize the details associated with nonimpacted, inaccessible soil in this section of the ISOU RI Report.

30. Table 4-2: Table 4-2 lists the minimum and maximum values and the arithmetic average of all the measurements. In order to form a complete understanding of the measurements, two other values should be presented: the median and the modal values. For example, in the first row of table 4-2 the plant 1 soil radium values are listed as 0.39 minimum, 623 maximum and 6.58 average. This is such a large range of values that the average by itself does not tell the reader what is going on. The cited measurements suggest that there is a radium hotspot in plant 1; but, is there one hotspot, two hotspots or more? There is no way to know from the data as presented. The median and the mode would present a much more complete understanding what the measurements really mean.

31. Table 4-2: Please provide a footnote with meaning of the grey-shaded cells.

32. Table 4-2: Please verify the accuracy of BSNF RR (DT-12) summarized results. Total samples on table 4-2 indicate 480, while appendix E, table E-22, shows 484.

33. Section 4.2.7.2, page 52. The text reports that areas of radiological contamination are present beneath the two salt domes, but there do not appear to be any plans to address those areas of contamination.

34. Section 4.3.1.2: Where did the Ra-226 and Th-230 values come from?

35. Section 4.4.3.2, last paragraph, and table 4-3: Please verify the accuracy of BSNF RR (DT-12) summarized metals results on table 4-3. There are no data indicated for uranium; instead, there is a superscript noting that summary data do not include soil associated with sewers. However, reading the text, it indicates that the "results for cadmium and uranium metals analysis...were below screening levels." Results for uranium are not presented on table E-23 either. Please revise text and/or tables for accuracy.

36. Section 4.6, paragraph three, last sentence: The text sets forth a gross alpha screening level of 3900 dpm/100 cm^2. How was this value derived? It is not acceptable to simply assert a limiting value without explaining how it was derived. A brief cogent explanation should be inserted into the text.

37. Section 4.6 and table 4-4: In multiples places on this table, instead of data, dashes (--) are indicated. According to the matching footnote for this symbol, "Sampling was not proposed in the RI WP." Reading the text of the accompanying subsections of section 4.6, there is no information to support not conducting a survey on that portion of the particular buildings. For every survey area indicated as "--" on table 4-4, please provide information in the accompanying text as to why that area was not proposed for surveying. The reader should be able to understand why certain areas were not surveyed without having to obtain the RI WP.

38. Section 4.6.10: There are no figures referred to for the properties discussed in this section. At a minimum, reference to figure 1-2 would be helpful to the reader to put these property locations into context with SLDS. In addition, there are discrepancies between the buildings stated as being surveyed (in the text) and data tables presenting the survey results in appendix F. For example, buildings DT-20 and DT-26 were reported as surveyed; however, there are no data tables for these buildings in appendix F. For one building, DT-21, there are two data tables presented in appendix F: F-63 and F-64. Please review this section and revise as appropriate.

39. Section 4.7, paragraph two, second sentence: For consistency with earlier sections of the report, please revise "10^{-6}" to "1E-06."

40. Table 4-5: Please provide the definition of "FOD" as a footnote.

41. Section 4.7.2.2: Is this subsection heading missing a title? Please revise as appropriate.

42. Section 4.7: Throughout this section, there are subsections titled "Sediment Sampling Results" and "Soil Sampling Results." For consistency with the text and tables 4-6 and 4-7, it is recommended that these titles be revised to "Sewer Sediment Sampling Results" and "Sewer Soil Sampling Results."

43. Section 4.7: While analytical data are summarized in this section for sewer soil samples, summary data tables for sewer sediments are not. There are no summary tables for either radiological or metal analytes for sewer sediments. This is not consistent with the manner in which data have been summarized in earlier portions of the report for soil and building surveys. It is recommended that sewer sediment summary tables also be presented, as appropriate, in this section.

44. Section 4.7.2.4 and table 4-6: Table 4-6 shows Th-230 to be greater than the screening levels in plant 1 sewer soil. Section 4.7.2.4 states that there is no radiological impact from the plant 1 sewer soils. These seem to be conflicting statements. It seems that one statement refers to the sewer soils and the other to the adjacent soils. Perhaps this could be re-worded to be clearer.

45. Table 4-8: It would be helpful to revise this table title, or column headers, to somehow indicate that COPCs are presented in this table.

46. Section 5.0, Page 115. The text states that "The CSM does not consider future scenarios in which the inaccessible soil areas become accessible due to removal of buildings, ground cover, etc., because this would result in conditions that would have to be addressed in accordance with the 1998 ROD, which considers only accessible soils." The National Oil and Hazardous Substances Pollution

Contingency Plan requires that future use scenarios, absent any institutional controls, be considered in the risk assessment.

47. Section 5.4.1, paragraph one, third sentence: This sentence states that "In water, the partitioning of an element between dissolved and adsorbed forms is influenced greatly by the geochemical characteristics of the site. It is necessary, therefore, to rely on estimates of the K_d....."

    Why were the K_d values estimated? There is a database of soil borings with detailed descriptions of soil morphology and geochemistry. For example, in the third paragraph of section 5.4.2, it states: "Metals are typically attenuated by clay soil, such as that found in the subsurface environments at the SLDS...." Further, in paragraph three of section 5.4.2.2, it states: "Under the near-neutral pH conditions observed in shallow ground water at the SLDS...." Given what seems to be, from these and other statements in the body of the text, a significant body of geochemical data from the site, why were K_d values not generated from site-specific data?

48. Section 6.1, page 135. Here and in other locations, the risk assessment reports that a dose value of 25 mrem/yr, and a potential excess cancer risk value of 1E-05, were used as screening levels. As noted in general comment 4, the EPA guidance does not consider a dose of 25 mrem/yr to be sufficiently protective under the Comprehensive Environmental Response, Compensation, and Liability Act. Also, the EPA screening values are based on a potential excess cancer risk of 1E-06, not 1E-05.

49. Section 6.1.1, page 135. The text identifies Ac-227 as one of the COPCs at the site. However, table 4-1 does not include this compound. Please reconcile.

50. Section 6.1.1, paragraph two, first set of bullets for inaccessible soils: Is Plant 6, Radiological, missing from this bullet list? Referring to table 4-8, that information is shown for plant 6. Plant 6 showing risks exceeding acceptable criteria are also presented in section 6.1.2.1, paragraph four, first group of bullets; and plant 6 is also shown as a bullet in this similar section for appendix K. Please evaluate and revise if necessary.

51. Section 6.1.2.2: It is not clear what additional calculation is being performed here and why. Please be more specific to elaborate on this separate evaluation to enable the reader to understand the reasoning behind it and the general approach.

52. Section 6.1.2.2, page 142. Why was the utility worker scenario the only one evaluated in the "elevated measurement areas"?

53. Section 6.1.2.3, paragraph two: EPCs for building and structural surfaces are calculated... and converted to the unit of picocuries per square meter. A sample calculation showing these conversions would be helpful.

54. Section 6.3, page 145. Why was the construction worker scenario evaluated only at off-site properties and excluded from evaluation on-site?

55. Appendix B, section B 3.2: The definition of "U", "The material was analyzed for a parameter, but it was not detected above the level of the associated value." This statement is incoherent. What does the phrase "....the level of the associated value" mean? Please revise for clarity.

56. Appendix B, section B 4.0: The normalized absolute difference (NAD) is presented as an alternative statistical analysis when the relative percent difference (RPD) value is greater than 50 percent. The NAD is applied to a sample size of two, the initial value and the split sample value. The analysis then chooses the 95th percentile (1.96 sigma) as the decision point to determine if the values are statistically the same. The use of the NAD for this analysis needs to be either justified or replaced with a conservative decision rule. The following decision rule is recommended: if the RPD value is greater than 50 percent, use the higher analytical value.

    From a theoretical standpoint, it is questioned whether the NAD is applicable to this data set at all. No justification is presented for the use of the NAD and several considerations militate against its use. For one, the Gaussian Normal probability distribution function is a distribution for continuous variables. In the appendix B tables, the NAD is calculated for each set of two measurements, the original analysis and the split or replicate sample analysis. These two analytical values are discrete, noncorrelated discontinuous values rather than continuous ones. Other statistical distributions, such as the Poisson probability distribution function assume noncorrelated discontinuity of values. Why were not Poisson statistics used to analyze these paired values which are binomial by definition? The standard deviation of any measurement in a Poisson distribution is simply the square root of the measurement. So the standard deviations of each values of a pair of measurements could be found by taking the square root of each of the individual measurements. Further statistical analysis could proceed from there.

    There is a substantial question about whether or not the NAD is an appropriate analytical tool for other reasons. There is no justification presented for the use of the NAD for a sample size of two. It is mathematically correct that a sample size of two is the minimum sample size (N-1 degrees of freedom) for a parametric analysis of a normally distributed sample population and that the 95th percentile is a reasonable decision level. However, both the theoretical and practical usefulness of doing this parametric analysis on a sample size of two is questionable.

    On a practical level, the usual caution is that a sample size of three is the absolute minimum for parametric analysis of normally distributed sample populations, and a sample size of ten is the minimum for truly meaningful results. So even if for the sake of argument it were conceded that the NAD is the appropriate statistical tool, the sample size is too small a data set from which to draw meaningful conclusions. The use of the NAD should be abandoned for this data set. Instead, this decision rule should be applied: if the RPD is greater than 50 percent, use the highest value of the two. The table should be rewritten without the NAD.

57. Appendix B, section B 4.3: "These very low MDCs are achieved through the use gamma spectrum [analysis] for all radionuclides of concern with additional analyses from alpha spectrum for thorium and ICP for metals." Uranium has a large number of closely spaced, low-energy gamma emissions. These emissions are interspersed in the natural background, unlike some radioisotopes such as CO-60 which has two very characteristic and unique high-energy gamma emissions that stand above the background radiation. Given large number of low-energy emissions from uranium, it is not practical to identify or quantify uranium with gamma spectrum analysis. So why was gamma spectral analysis set forth as a technique for uranium analysis when it is not a practical technique to use?

58. Appendix B, section B 5.2, Data Evaluation: "The minimum instrument efficiency was greater than 0.17 for alpha radiation, which was sufficient to achieve the desired limit of detection." Please show a sample calculation for minimum instrument efficiency showing actual measured background for some relevant portion of the project.

59. Appendix E: In every table of radioisotope values there appears negative results for minimum measurement values. For example, in table E-1 the minimum value of Th-230 is listed as -95.80 pCi/gm. Of the nine radioisotopes in table E-1, five of the summary minimum values listed are negative, less than zero. How is it possible to have negative pCi/gm values? These negative values must be the result of some computational formula. However, for presentational purposes, computations should be truncated at zero. There should be a footnote stating that the negative values were truncated at zero. Are these negative values included in the averages presented in the tables? If so, the averages are wrong since the averages should be calculated using zero in place of the negative table values. These table values should be recalculated and the table changed.

60. Appendix E: In all of the tables of radiological data in appendix E, there is a letter G behind the symbol of every radioisotope in the table. For example, there are columns labeled U-235G. The chemical symbols for the elements do not include the letter G as a suffix. If the letter G has a meaning, that meaning should be set forth in a footnote to the table. If it has no meaning, it should be removed.

61. Appendix E: Tables in this appendix present data associated with data qualifiers, such as "U" or "J", etc. Please provide footnotes to these tables providing their definitions or indicate where in the ISOU RI Report to find their definitions. Perhaps appendix B.32 is appropriate.

62. Appendix E Tables: The tables in appendix B need to be carefully re-edited. In table B-1 both Th-230 columns are labeled "RPD". In the Th-232 columns, the headings "RPD" and "NAD" are reversed. These errors are also found in B-2 and B-5 and almost every other table in appendix B.

63. Appendix F, table F-1: In table F-1 there is a column labeled "Surface Eff*." Is this "surface efficiency"? What is surface efficiency? Why is there an asterisk? An asterisk is used to indicate to the reader that there is an explanation somewhere else in the text, but there is no explanation in table F. If the asterisk is important, it should be explained. If it is not important, it should be eliminated. Furthermore, all the numerical values in the "Surface Eff*" columns are 1. It would make the table less cluttered and more readable if these columns were eliminated and a footnote was placed in the table defining the concept of surface efficiency and stating that it was assumed to have a numerical value of one. If there are calculations involved in table F-1, there should be an example calculation included in the text so the reader may understand the values presented.

64. Appendix I: In complete contrast to appendix E, this appendix provides a masterful presentation of the data, a complete and coherent explanation of the statistical analyses used and tables with complete footnotes and listings of the abbreviations used and devoid of useless and distracting duplicate data in the table. It is recommended that the author of appendix I be assigned to rewrite appendix E to the same high standards.

65. Appendix K2.0, page K-3. The text says "In order to facilitate this evaluation, it is assumed that all inaccessible soil at each property has become accessible, so that inaccessible and accessible soil can be assessed under one consistent set of (accessible) exposure scenarios." How does this statement

relate to the statement on page 115 which says "The CSM does not consider future scenarios in which the inaccessible soil areas become accessible:..."? Please reconcile.

66. Appendix K2.3.2, page K-11. The EPA recommends that the construction worker scenario be evaluated at the plant properties and Vicinity Properties, in addition to the industrial worker scenario, for transparency purposes.

67. Appendix K2.3.2.2, page K-14. The text says that "Data were incorporated into the EPC calculations that included locations above screening levels, as well as nearest sample locations that exhibited no screening level exceedances." Why were sample results that did not exceed screening levels specifically included in the EPC calculations? What impact did this have on the EPCs? Clarification is needed.

68. Appendix K2.5.3.8, page K-31. The text says, "However, because of the unique toxicological properties of lead, risk is not quantitatively evaluate for this COPC, as was discussed in Section 6.4.2.5." There appears to be no section 6.4.2.5. Regardless, the "unique toxicological properties of lead" are not justification for excluding it from the risk assessment.

69. Table K-2A. It is not apparent to us how in some instances a radiological compound can have an EPC of 0.00 when numerous positive data points exist, and a 95 percent UCL has been determined (for example Ra-228 at Plant 1).

70. Table K-2A. It is not apparent to us how in some instances a radiological compound can have a positive EPC value when no data are apparently available (e.g., Pb-210 at plant 1).

71. Appendix K4.2 (p.K-46): Similar to general comment 3, this section states that a qualitative ecological assessment was conducted in the 1993 Department of Energy Baseline Risk Assessment. However, the 1993 BRA states that "no investigations have been conducted at the St. Louis Site to assess the extent to which biota have been contaminated or affected as a result of exposure to site wastes." Please provide an explanation.

72. Appendix M, EPC Calculations ISOU Structures - Industrial Workers: There is no title or number on the first table so I assume that it is table M-1. A title and page numbers should be added. Also, footnote 2 on this table states: "Individual radionuclide exposure point concentration input values are calculated by multiplying the gross alpha UCL-95 value by the radionuclide specific activity values." That definition is correct, but the numerical values in the table do not reflect that definition. An example is Ac-227, in which 1268 is the gross alpha and 0.022 is the specific activity value for building 25. Ac-227 in building 25: (1268 x 0.022) = 27.89 Column D value = 1272. The problem is in column C, "Activity Fraction " (0.022 in the example). The conversion factors from pCi/g to pCi/m2 were not included in the values found in this column. The correct activity fraction value for Ac-227, including the units conversion, is 1.0035, not 0.022. Multiplying (1268 x 1.0035) yields 1272, which is the correct value found in Column D. The table should be rewritten and all of the Activity Fraction values restated to include the units conversion factors. A sample calculation should be included in the rewritten table.

73. Appendix M, table DT-8 (PSC Metals, Inc.): There is no number for this table. The title of the table seems to be "Radiological Analytical Data Results for Inaccessible Soil." However, the section is entitled "EPC Calculations-DT-8 ISOU Industrial." There are no EPC calculations presented in the table, only what seem to be radiological measurements. Furthermore, there are a great many negative radiological measurements in the table. This is absurd. There can be some radioisotopes present or zero radioisotopes present, but there cannot be negative radioisotopes present. If this table is supposed to present EPC calculations, it needs to be completely rewritten as there are currently no EPC calculations there at all.

74. Appendix M, table DT-8, PSC Metals North Tract 4. Again, there is no table number or obvious title. Behind every radioisotope listed in this table is the letter "G." For example, Ac-227G. This "G" has no place in the radioisotopes. To not know the standard chemical nomenclature seems to be a disturbingly elementary level of ignorance.

75. Appendix M, Tables: The entire set of tables in appendix M is unacceptable as it stands. They should be rewritten. Correctly calculated values should replace the present ones, the tables should be correctly numbered and titled, and a sample calculation should be included in each table.

76. Appendix N: table N-11, Metal COPCs and EPCs for Property-Wide Inaccessible and Accessible Soil at Thomas and Proetz Lumber (DT-10) Industrial Worker: There is only one contaminant of concern. It is not clear how to derive the value given for the Entire Property Area from the values given for the accessible and inaccessible property areas, respectively. The calculation of the area-weighted average should be set forth.

The EPA makes the following administrative/editorial comments:

77. Superscripts used in tables are so small they are extremely difficult to read. Please increase the font size.

78. Please add the following to the acronym/abbreviation list: SLAPS and USCS.

79. Table 2-2: Please define "NA" and "RR" as footnotes.

80. Section 4.5.2.2, paragraph two, first sentence: Please insert a space between "Figure" and "C-21."

81. Appendix F, table F-1: Please correct the page layout for this table to ensure it prints properly.

If you have questions, please contact me at (913) 551-7520.

Sincerely,

Matthew Jefferson
Remedial Project Manager
Missouri/Kansas Remedial Branch
Superfund Division

cc: Daniel Carey, MDNR
Patrick Anderson, MDNR (via email only)
Tiffany Burgess, MDNR (via email only)
Robin Rodriguez, Chamberlin (via email only)
Brenton Barkley, USACE (via email only)

AR-014