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LETTER REGARDING REMEDIAL INVESTIGATION REPORT FOR SITE 17 NAS WHITING FIELD FL
11/5/1999
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UNITED STATES ENVIRONMENTAL PROTECTIOI
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

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November 5, 1999

4WD-FFB

Ms. Linda Martin
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

SUBJECT: RI Report for Site 17

Dear Ms. Martin:

The United States Environmental Protection Agency (EPA) has received and reviewed the Remedial Investigation (RI) Report for Site 17, Crash Crew Training Area, at NAS Whiting Field, dated February 1999 . Enclosed are EPA's comments based on this review.

If you should have any questions, please contact me at (404) 562-8555.

Sincerely,

Craig A. Benedikt

Craig A. Benedikt
Remedial Project Manager
Federal Facilities Branch

Enclosure

cc: Jim Cason, FDEP

EPA Comments on:
Draft Remedial Investigation [RI] Report
Site 17, Crash Crew Training Area
February 1999

SPECIFIC COMMENTS

1. **Page 5-1, Section 5.1, Second Paragraph**. The text states, "One clay seam (of varying thickness) was encountered at approximately 40 to 50 feet bls at the location of three monitoring wells (WHF-17-1S, WHF-17-2 and WHF-17-3) drilled at the site." However, the text does not state the range of varying thickness of the clay seam. This is an important detail for evaluating the stratigraphy of the site. Therefore, the range of the clay seam thickness should be stated in the text.

2. **Page 5-1, Section 5.2, Groundwater Flow Direction**. The text states, "Table 5-1 summarizes the results of the water-level measurements recorded in the northwest quadrant during the RI field program. Groundwater flow patterns and potentiometric surface maps depicting the February 8 and 9, 1994 event (Figure 5-1) and the November 7 to 9, 1996 event (Figure 5-2) are included in this report." According to the data presented in Table 5-1 and Figures 5-1 and 5-2 the water level measurements were collected over a 2 to 3 day period, not all during one day. The measurement of water levels in the monitoring wells used for the construction of potentiometric surface maps should not take place over more than a one day period due to water level fluctuations over time which can occur within the aquifer. Future groundwater sampling events should be scheduled so that the water levels in monitoring wells used for the construction of potentiometric surface maps will be measured in one day. As an alternative, water levels in all of the wells should be obtained during a single day, independent of, and in addition to, water level measurements collected during well sampling events.

3. **Figures 5-1 and 5-2**. The title of each figure indicates only the month that the potentiometric surface was measured. The title of each figure should be changed to include the day as well as the month that the water levels in each well were measured.

4. **Page 5-18, Table 5-6**. As reported on Table 5-6, the result for the constituent concentration for xylene (soil sample number 17-SL-11 collected on 08/16/92), is 30,000E. However, the table does not provide a foot note for the "E" designation following the 30,000 value. An additional foot note should be included at the end of Table 5-6 explaining the "B" designation after the result.

5. **Page 5-34, Table 5-10**. As reported on Table 5-10, the result for the constituent concentration for di-n-butylphthalate (soil sample number 17SB8-10-12 collected on 01/18/93) is 310BJ. The table does not provide a foot note for the explanation of the "B" designation preceding the J. An additional foot note should be included at the end of Table 5-10 explaining the "B" designation after the result.

6. **Page 5-42, First Paragraph**. The first sentence is repeated three times in the first paragraph. The text should be corrected.

7. **Page 5-42 and 5-45, Phase II Groundwater Samples**. The text states, "Turbidity measurements for Phase IIA groundwater samples [collected in 1993]ranged from 2.58 to 1,241 nephelometric turbidity units (NTUs). Turbidity measurements for phase IIB groundwater samples, collected [in 1996] using low-flow sampling methods, ranged from less than 1.0 to 6.78 NTUs. The low-flow sampling method produces less turbid samples. These samples are more representative of the surficial aquifer than those obtained with a bailer. Therefore, the preferred data set was from the Phase IIB sampling event. The number and concentration of inorganic analytes detected in groundwater samples collected during the 1996 sampling event are generally lower than in the corresponding samples collected during the 1993 sampling event. Therefore, the 1993 groundwater analytical data were not discussed nor were they included in the summaries of groundwater analytical results presented in this report. It would be inappropriate to discount the entire analytical data package from the 1993 sampling event due to excessive turbidity. The 1993 groundwater analyses should be presented on the summary tables for the RI Report because the volatile organic compounds, semi-volatile compounds, pesticide and polychlorinated biphenyls laboratory analyses are valid even though the metals analyses are questionable due to high turbidity. The inorganic results should be presented for comparison purposes. In addition, EPA Region IV policy does not allow the exclusion of turbid sample analytical results from consideration in the site investigation decision making process.

Site 17 Human Health and Ecological Risk Assessment Comments

GENERAL COMMENTS:

8. Table 6.1 presents the selection of human health chemicals of potential concern for surface soil (HHCPCs). In this table, nine inorganic compounds are considered HHCPCs. However, two of these analytes, barium and copper, are not carried through the risk assessment. In addition, Section 6.2.1 states that Table 6.1 identifies seven inorganic analytes (aluminum, antimony, arsenic, cadmium, chromium, iron, and vanadium) as being HHCPCs. Tables C-10 through C-20 in Appendix D also show that barium and copper were not carried through the risk calculations for surface soil.

Presumably, barium and copper were not carried through the risk assessment due to a lack of RfD values for the contaminants in the EPA's Integrated Risk Information System (IRIS) database. IRIS was recently updated to include a new RfD for barium, and the copper RfD is available through EPA's Health Effects Assessment Summary Tables (HEAST). Both barium and copper are above their selected screening concentrations and above their respective background screening concentrations. Because these chemicals were listed as HHCPCs in Table 6.1, they should be quantitatively assessed. The new revision of the report should include barium and copper in the risk calculations, and other appropriate sections of the report should be changed to acknowledge their inclusion.

9. Section 6.4 of the report presents the human health toxicity assessment for Site 17. The text states that Appendix D contains brief toxicity summaries for human health contaminants of potential concern (HHCPCs) identified in surface soil, subsurface soil, and groundwater at the site. However, Appendix D does not presently contain information on barium (see comment 1). This information should be added in the new revision.

10. Figure 6-1 shows the complete and potentially complete exposure pathways for human receptors. The figure seems to be inconsistent with the information given in Table 6-4 and the text. The table states that no humans currently reside or work at Site 17 and were, therefore, not selected for pathway evaluation. In addition, the text in Section 6.3.1 indicates that a current residential receptor scenario does not exist. However, the information in Figure 6-1 shows that completed pathways for groundwater inhalation and ingestion exist for a current resident exposure scenario. The current resident receptor column should be deleted from Figure 6-1 to be consistent with the information presented in other portions of the RI Report.

11. Section 6.3.4 discusses the exposure point concentrations (EPC) for groundwater. The text states that the EPC that was used for the HHCPCs was the lesser of the maximum detected concentration and the arithmetic mean of the samples collected within the groundwater plume. This is in concurrence with the EPA Risk Assessment Guidance for Superfund. However, the text later states that since no groundwater plume was identified on site, the arithmetic mean of all groundwater samples was used as the EPC. The maximum detected concentration should be used instead of the arithmetic mean to produce a more conservative estimate, especially since there were only four samples taken at the site.

12. It is discussed in Chapter 7 that risks are calculated for terrestrial wildlife using Hazard Quotients (HQs) and Hazard Indices (HIs). The text explains that HQs less than one would result in no adverse ecological effects and HIs greater than one would result in possible adverse ecological effects and warrant further discussion. However, it is not discussed how an HI or HQ equal to one would be addressed. This scenario should be addressed in the risk characterization section of the text.

13. An extensive review of the RTV selection process is recommended for this report. Several inconsistences were found between the RTV selections made in Tables E-2 and E-3 and the data evaluation hierarchy described in Section 7.5.1. RTV selection plays a significant role in the ERA process and any RTV changes could potentially change the conclusions of the ERA. The individual problems associated with RTV selection are described in more detail in the specific comments section of this review.

14. In a December 22, 1998 memo from Ted W. Simon, a toxicologist for the USEPA Region IV Office of Technical Services, new surface soil guidelines for Region IV are introduced. Surface soil screening values used in this ERA should be replaced with the newly issued Region IV ecological surface soil screening values. The ERA should be reevaluated with respect to the new guidelines and changes should be made as appropriate.

SPECIFIC COMMENTS

15. **Table 5-8, Page 5-27.** The title of the table is called "Summary of Soil Organic Analytical Results." Since it apparently contains results for surface soil only, the title should read surface soil, instead of just soil.

16. **Table 5-8, Page 5-27.** The table incorrectly lists the number of samples analyzed for VOCs as 39. From the raw data presented in Appendix C, there were 34 total samples analyzed for VOCs. Also, some of the numbers for frequency of detects are listed incorrectly for the same VOCs. For example, 2-butanone was detected in 3 samples, not 4; carbon disulfide was detected in14, not 17; ethylbenzene was detected in 6, not 7; methylene chloride detected in 2, not 3; toluene detected in 4, not 6; and xylenes in 20, not 24. These values should be changed to reflect the correct information.

17. **Table 5-9, Page 5-29.** The table presents a summary of surface soil inorganic analytical results. Some of the "frequency of detects" are incorrectly reported. From the raw data tables presented in Appendix C, nickel was detected in surface soil 22, not 23, times; and silver was detected 4, not 6, times in surface soil. These changes should be made to reflect the correct information.

18. **Table 5-13, Page 5-40.** The table presents a summary of subsurface soil inorganic analytical results. The table incorrectly lists the number of samples tested for inorganics as 19. From the raw data presented in Appendix C, there were 18 samples taken. Also, some of the numbers for frequency of detects are listed incorrectly for the same inorganic analytes as a result of this change. These values should be checked and changed accordingly to reflect the correct information.

19. **Table 5-16, Page 5-46.** The table presents a summary of groundwater analytical results.

A number of the frequency of detects are incorrectly reported. From the raw data tables presented in Appendix C, nickel was detected in groundwater 1 time, not 4, and zinc was detected 3, not 2, times in groundwater. These changes should be made to reflect the correct information. Also, the second page of the table lists the table number as C-16. This number should be changed to 5-16.

20. **Section 6.2.1, Page 6-3.** This paragraph, depicting the results of analysis of surface soil data, is misleading. There is a statement indicating that the raw data are presented in Table 3-1. However, this table is not present in the document. From the surrounding sections and text, it appears that this table appears in the GIR (HLA, 1998). This should be indicated in the paragraph.

21. **Table 6-1, Page 6-4.** The table presents the selection of HHCPCs for surface soil. There are three separate discrepancies in the table. First, in the column of the range of detected concentrations the max detected for bis(2-ethylhexyl)phthalate is presented incorrectly as 800* (the * indicating that the max was an average of duplicate samples). From the raw data presented in Appendix C for surface soil, the highest detected concentration of bis(2-ethylhexyl)phthalate was 750. Second, the selected screening concentration of 0.16 listed for beryllium is incorrect. From the October 1998 RBC tables, the screening concentration for beryllium is 16. Third, The frequency of detects for nickel and silver are listed incorrectly as 23/34 and 6/34, respectively. From the raw data presented in Appendix C, the nickel was detected in 22/34 samples and silver was detected in 4/34. These changes should be made to reflect the correct information.

22. **Table 6-2, Page 6-7.** The table presents a selection of HHCPCs for subsurface soil. The table incorrectly lists the number of samples tested for all analytes as 15. From the raw data presented in Appendix C, there were 18 samples taken. Also, some of the numbers for frequency of detects are listed incorrectly for the same analytes as a result of this change. These values should be checked and changed accordingly to reflect the correct information. This change also needs to be made to Table 6-6 on page 6-17, which presents a summary of the HHCPCs chosen in Table 6-2.

23. **Section 6.2.3, Page 6-10.** This paragraph depicting the results of analysis of groundwater data is misleading. There is a statement indicating that the raw data are presented on Table 3-3, however this table is not present in the document. From the surrounding sections and text, it appears that this table appears in the GIR (HLA, 1998). This needs to be indicated in the paragraph.

24. **Table 6-8, Page 6-20.** The table presents a risk summary for current land use at the site. The HIs listed for the adult and adolescent trespassers do not coincide with the HIs calculated and presented in Appendix D. For the adult trespasser, the HIs are listed as 0.01 and 0.02, for incidental ingestion and dermal contact respectively, totaling 0.03; but from Appendix D, table D-10, the HIs are 0.1 and 0.09, for incidental ingestion and

dermal contact respectively, totaling 0.2. For the adolescent trespasser, the HIs are listed as 0.02 and 0.04, for incidental ingestion and dermal contact respectively, totaling 0.06; but from Appendix D, table D-12, the HIs are 0.2 and 0.1, for incidental ingestion and dermal contact respectively, totaling 0.3. These values need to be changed to reflect the correct information. This change will also affect Figure 6-3 on page 6-24, which presents a bar graph representing the summary of noncancer risk summary for current land use of surface soil.

25. **Table 6-9, Page 6-21.** The table presents a risk summary for future land use at the site. The HIs listed for the adult and adolescent trespassers do not coincide with the HIs calculated and presented in Appendix D. For the adult trespasser, the HIs are listed as 0.01 and 0.02, for incidental ingestion and dermal contact respectively, totaling 0.03; but from Appendix D, table D-10, the HIs are 0.1 and 0.09, for incidental ingestion and dermal contact respectively, totaling 0.2. For the adolescent trespasser, the HIs are listed as 0.02 and 0.04, for incidental ingestion and dermal contact respectively, totaling 0.06; but from Appendix D, table D-12, the HIs are 0.2 and 0.1, for incidental ingestion and dermal contact respectively, totaling 0.3. These values need to be changed to reflect the correct information. This change will also affect Figure 6-5 on page 6-26, which presents a bar graph summary of noncancer risks for future land use of surface soil.

26. **Figure 6-2, Page 6-23.** The figure presents a bar graph representing a cancer risk summary for the current use surface soil. The bar for the risk to the site maintenance worker is not consistent with the information presented in Table 6-8, the risk summary for current land use. Figure 6-2 presents the risk at about 1.6 E-07. From Table 6-8, the ELCR is listed as 1 E-07. These numbers should be checked and changes made accordingly to reflect the correct information.

27. **Figure 6-4, Page 6-25.** The figure presents a bar graph representing a cancer risk summary for the future use surface soil. The bar for the risk to the site maintenance worker is not consistent with the information presented in Table 6-9, the risk summary for current land use. Figure 6-4 presents the risk at about 1.6 E-07. From Table 6-9, the ELCR is listed as 1 E-07. These numbers should be checked and changes made accordingly to reflect the correct information.

28. **Figure 6-5, Page 6-26.** The figure presents a bar graph listing the noncancer risk summary for future land use of surface soil for the receptors adult trespasser, site maintenance worker, occupational worker, and child resident. Between the bars for each of these receptors, there are bars presented that do not appear to be representative of anything. These extra bars on the graph should be removed.

29. **Figure 6-6, Page 6-27.** The figure presents a bar graph representing a cancer risk

summary for the future use subsurface soil. The bar for the risk to the excavation worker is not consistent with the information presented in Table 6-9, the risk summary for current land use. Figure 6-6 presents the risk at about 1.3 E-07. From Table 6-9, the ELCR is listed as 6 E-08. These numbers should be checked and changes made accordingly to reflect the correct information.

30. **Table 7-1, Page 7-7**. Table 7-1 shows the endpoints selected for the ecological risk assessment. In Section 7.2.3, the assessment endpoints are defined as representing the ecological component to be protected. However, in Table 7-1 the assessment endpoints for terrestrial plants and terrestrial invertebrates are stated as being a reduction in the biomass of terrestrial plants used as forage material and a reduction in the abundance of earthworms used as forage material, respectively. Reductions in forage material are not ecological components to be protected. The assessment endpoints in Table 7-1 are not consistent with the definition of an assessment endpoint provided in Section 7.2.3. This inconsistency should be corrected.

31. **Section 7.2.3, Page 7-8**. Three hypotheses were developed to gauge potential risks associated with exposure to Site 17 surface soil. The hypotheses, however, are phrased in the form of questions, which does not fit the definition of a hypothesis. Hypotheses are predictions or estimations of possible results of a study or experiment. Either the term "hypotheses" should not be used in this section or they should be changed from questions to statements that fit the definition of the term hypothesis.

    It is also stated in this section, "For terrestrial plants and invertebrates at Site 17, the *assessment endpoints* are benchmark values derived from the literature." It is believed that these are actually measurement endpoints as opposed to assessment endpoints. The text in this section should be appropriately changed.

32. **Table 7-3, Page 7-15**. Table 7-3 provides the equations used to calculate the potential dietary exposures for wildlife receptors. In the equation for the secondary prey item concentration, the component "tissue concentration of primary prey items" is noted with an asterisk. However, there is no footnote in the table that is denoted with an asterisk. The asterisk in Table 7-3 should be removed.

33. **Section 7.4.2, Page 7-18**. The bulleted paragraph on page 7-18 provides a discussion of the red-tailed hawk as a wildlife receptor. The home range of the red-tailed hawk is not provided in this discussion although the home ranges for other ecological receptors are discussed. The home range of the red-tailed hawk should be provided in this section.

34. **Table 7-5, Page 7-19**. This table describes the exposure parameters for representative wildlife species used as receptors in this remedial investigation. Many of the parameters are cited from the *Wildlife Exposure Factors Handbook* (USEPA, 1993); however, it is not consistently stated how some of the data are derived from the Handbook. Several

questions were noted about the data in Table 7-5.

- It is not stated whether averages of the exposure parameters were calculated or if a certain study was selected. For example, it is not explained how the values in the column titled, "Assumed Diet for Terrestrial Exposure Assessment (% of diet)," were derived. The dietary composition data for the deer mouse (surrogate for the cotton mouse) provided in the handbook are seasonal percentages with invertebrates comprising as much as 63% of the deer mouse's diet, but Table 7-5 states that invertebrates make up 10% of the deer mouse's diet. This discrepancy needs to be clarified.

- It is stated that soil ingestion percentages were obtained from the Wildlife Exposure Factors Handbook for the short-tailed shrew and the red-tailed hawk. However, these data were not located in the Handbook during the review. If surrogate species were used to obtain soil ingestion data for the short-tailed shrew and the red-tailed hawk, it should be noted in Table 7-5.

- It is also stated that home ranges were obtained from the Wildlife Exposure Factors Handbook for the red fox and red-tailed hawk. Many different home ranges from many different studies are presented in the Handbook. It is unclear as to how the home range values presented in Table 7-5 were calculated from this data. If averages were calculated from specific studies it should be specifically stated in the table.

- The food ingestion rate (FIR) for the red-tailed hawk was calculated using the bird equation based on body weight from the Handbook. An FIR of 0.113 kg/day for the red-tailed hawk is presented in Table 7-5; however, when calculated using the EPA bird equation and the body weight provided in Table 7-5, an FIR of 0.059 kg/day results. This calculation should be reevaluated and checked for accuracy.

35. **Section 9.1, Page 9-1, Conclusions**. The text states that seven inorganic analytes were detected in the surface soil that were either over the US EPA Region III residential soil or the Chapter 62-785 residential and leachability SCTLs. However, ten inorganics were detected, and they are listed in the text of this section (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, manganese and vanadium). Appropriate changes should be made in the text.

36. **Appendix D, Table D-1**. This table shows the surface soil screening concentrations that were in the selection of the human health chemicals of potential concern. There is an error in the presentation of the Risk Based Screening Concentration (RBC) for trichloroethene. According to the Region III RBC Table, the correct RBC for trichloroethene is 58,000 µg/kg and not "58,00 µg/kg." The table should be modified.

37. **Appendix D, Table D-2**. The table presents the subsurface soil screening concentrations

for the selection of chemicals of potential concern. There are a few discrepancies with the information presented in the table. First, the screening concentrations selected in the table for Acetone and Diethylphthalate, 1,800,000 and 100,000,000 respectively, are neither the RBCs nor the FL Soil Target levels listed for these compounds in the table. The concentrations selected should be 5,500,000 for acetone and 640,000 for diethylphthalate as in the previous columns on the table. Next, the RBC for chromium and copper are listed incorrectly as 1,000 and 100,000 respectively. From the RBC tables referenced, the RBC for chromium VI is 610 and the RBC for copper is 8,200. This will affect the Selected Screening Concentration for copper. Lastly, the footnote number 7 states that Chromium IV values was used, but it should state Chromium VI, not IV. These changes need to be made to reflect the correct information.

38. **Appendix D, Table D-3.** The table presents the groundwater screening concentrations for the selection of chemicals of potential concern. The RBC value for Beryllium is listed incorrectly as 73. From the October 1998 RBC tables referenced. The RBC for beryllium is 7.3. Also, the selected screening concentration for sodium is listed as 160,000, but the only screening concentration presented for sodium is 396,022, which should also be the selected concentration. Finally, footnote 6 refers to Chromium IV, but it should reference Chromium VI. These changes need to be made to reflect the correct information.

39. **Appendix D, Tables D-10 through D-29.** These tables list the intake equations and calculations of intake for all of the exposure pathways. The tables are numbered C-10 through C-29. This numbering should be changed to reflect the numbers D-10 through D-29. Also, there is no indication on any of the tables of current or future land use. This should be indicated on each table.

40. **Appendix D, Table D-11.** The concentration of Total Petroleum Hydrocarbons found in surface soil is incorrectly listed in this table as 19.3 ug/kg. From table 6-5 which lists the surface soil exposure point concentrations, the EPC for TPHs is listed as 19,300 mg/kg which converts to 19,300,000 ug/kg. The value in table D-11 should be changed to 19,300,000. This discrepancy also occurs on the following tables: D-13, D-14, D-15, D-16, D-17, D-18, D-19, D-20, D-21, D-22, D-23, and D-28.

41. **Appendix D, Table D-12.** The table presents the equations for and calculations of intake concentrations for the incidental ingestion and dermal contact by the adolescent trespasser of surface soil. The dermal intake equation appears incompletely listed as: AT x 365 days/yr) x SA. There seem to be some factors missing from the beginning of the equation. This needs to be checked and changed as necessary to reflect the equation used.

42. **Table E-1, Appendix E.** The plant BAF [units of (mg/kg fresh tissue weight)/(mg/kg dry soil weight)] values presented in Table G-1 for semivolatiles were calculated using the equation presented in footnote [d]. BAFs of 1.1E-01, 8.7E-03, 4.3E-02 and 6.4E-02

were presented in the table for butylbenzylphthalate, bis(2-ethylhexyl)phthalate, 2-methylnaphthalene and naphthalene, respectively. However, when recalculated using the equation from footnote [d], BAFs of 2.9E-01, 2.2E-01, 1.1 and 1.6 result. The plant BAF calculations in Table E-1 should be reevaluated and checked for accuracy.

43. **Tables E-2 and E-3**. Table E-3 presents the RTVs selected for the ERA. Table E-2 presents ingestion toxicity data for wildlife.

It is unclear why the methylene chloride No Observed Adverse Effect Level (NOAEL) of 5.9 mg/kg/BW/day for small mammals was not used as the sublethal RTV in Table E-3. The text should be modified to include the referenced value.

It is unclear why the Lowest Observed Adverse Effect Level (LOAEL) of 76 mg/kg/BW/day for toluene was not used to calculate a sublethal RTV for small mammals in Table E-3. The text should be modified to include the referenced value.

It is unclear why the sublethal small mammal RTV value for benzo(a)pyrene was used as a surrogate for naphthalene when sublethal LOAEL values are available for naphthalene. Surrogates should not be used if chemical specific values are available.

For aluminum, a LOAEL of 425 mg/kg/BW/day was used to calculate the RTV value for small mammals when a lower LOAEL value of 100 mg/kg/BW/day was available. The lowest LOAEL value should be used when selecting RTVs. The text should be modified to include the referenced value.
It is unclear why the Lowest Observed Adverse Effect Level (LOAEL) of 0.35 mg/kg/BW/day for antimony was not used to calculate a sublethal RTV for small mammals in Table E-3. The text should be modified to include the referenced value.

For lead, a LOAEL of 300 mg/kg/BW/day was used to calculate an RTV value of 30 mg/kg/BW/day for small mammals when a lower LOAEL value of 2.5 mg/kg/BW/day was available. Using the lower value, an RTV value of 0.25 mg/kg/BW/day would be calculated. The lowest LOAEL value available should be used when selecting RTVs.