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LETTER TRANSMITTING REVISED DRAFT REMEDIAL INVESTIGATION REPORT 80TH DIVISION RESERVE SITE FORT STORY VA
4/18/2007
MALCOLM PIRNIE

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MALCOLM PIRNIE

INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

Malcolm Pirnie, Inc.
701 Town Center Drive
Suite 600
Newport News, VA 23606-4296
T: 757-873-8700
F: 757-873-8723
www.pirnie.com

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April 18, 2007

Ms. Joanna Bateman
Remedial Project Manager
U.S. Army Transportation Center
Building 1407, ATZF-PWE
Fort Eustis, Virginia 23604-5332

Re: **Revised Draft Remedial Investigation Report**
80th Division Reserve Site
Fort Story, Virginia
Contract DACA31-00-D-0043, D.O. 0024

Dear Ms. Bateman:

Malcolm Pirnie is pleased to provide to Fort Eustis this **Revised Draft Remedial Investigation (RI) Report** (2 copies enclosed) in support of the continuing investigations at this site at Fort Story. This report has been revised to incorporate your additional comments and the initial comments by the Virginia Department of Environmental Quality (VDEQ). The responses to the VDEQ comments are also attached. This report has also been submitted to VDEQ for their review and comment in a redline/strikeout format so that it will be easier to review the changes.

In addition to responding to the VDEQ comments, additional revision of the report was conducted because of guidance provided by the U.S. Army Environmental Command (USAEC) for the human health risk assessment (HHRA) and ecological risk assessment (ERA). A summary of the primary revisions to the report include the following:

- Per USAEC guidance, the residential land use scenario which was presented in the Draft Report has been deleted from this version because it is not considered a reasonable future land use for the site and Fort Story. If land use was to change in the future from the current situation of industrial usage due to potential re-development of the property or base closure, additional assessment may be warranted at that time; however, these land use changes are currently not forecasted, and therefore, the residential land use scenario is not evaluated.

- Although it had been agreed to with VDEQ that the risk assessments would not be revised because of only changes to the EPA RBCs, they were updated for this assessment because significant revisions to the HHRA and ERA were already being conducted.

- Due to the small size of the site, additional home range and land use factors were introduced into the ecological risk assessment which resulted in revised conclusions and recommendations.

It has been a pleasure to provide this document to Fort Eustis. We look forward to further discussions relative to this project.

Very truly yours,

MALCOLM PIRNIE, INC.

Anthony K. Pace
Project Manager

akp
0285-917-100

Enclosures

C: Wade Smith, VDEQ w/encl (2 copies)

Responses to VDEQ Comments
Draft Remedial Investigation and Quality Control Summary/Analytical Results Reports
80th Division Reserve Site
Fort Story, VA

Remedial Project Manager Comments

1. The Department has no comments on the *Draft QCS/AR Report* at this time.

   Response: None required.

2. 4.2.2.1, page 4-11 – Please insert a section heading for "**Metals**" as was done for "**Organics.**"

   Response: "Metals" header added.

3. 4.3.2, last paragraph, 3rd sentence, page 4-15 – This refers to "the shallow part of the aquifer." Please clarify the meaning of this phrase or the specific location to which this phrase is referring.

   Response: Additional text has been added to this paragraph for clarification.

4. 5.1.1, paragraph 2, page 5-3 – This states that infrequent detection is an indication that impact and risk is minimal. The Department recommends that, initially, all detected constituents exceeding screening criteria be evaluated. Discussions concerning the frequency of detection (and the criteria by which detections are determined to be "infrequent") may be addressed in the "**Uncertainty**" section.

   Response: This is the "Fate and Transport" section, not the risk assessment section. We agree that infrequent detection will not be utilized in Section 6 as a means of screening out a constituent. The purpose of this section was to discuss the migration characterizations of the primary constituents of concern and infrequent detection is a tool of limiting the list for discussion.

5. 5.1.1, **VOCs**, page 5-5 – The constituents listed do not include all those specified in the tables on pages 4-5, 4-10, and 5-2 through 5-3. Please specify the purpose for listing some of the detected VOCs and not others.

   Response: This list has been updated. Due to an oversight, all of the VOCs were discussed in the paragraphs that followed but not presented in this sentence.

6. 5.1.1, **VOCs**, page 5-5 – Benzene is listed here but is not shown on Tables 4-3 and 4-7, nor is a discussion provided for it later in this section. Please clarify this discrepancy.

   Response: Benzene should not have been on the list and it has been deleted.

7. 5.1.1, **VOCs**, pages 5-5 through 5-11 – Please correct the spelling for 2-butanone here and throughout the *Draft RI*. Also, please correct the headings for and verify that the correct information is provided for cis-1,2-dichloroethene and trans-1,2-dichloroethene (as opposed to the alkanes).

   Response: Changes made and the discussion was correct for cis and trans 1,2-DCE.

8. 6.1.2, last paragraph, last bullet, page 6-4 – This states that data may be evaluated based on the frequency of detection. Please see comment 4 above.

   Response: Text revised to state that infrequent detection will be discussed in the Uncertainty section and not as a method to screen out constituents before the quantitative assessment.

9. 6.1.2, last paragraph, last bullet, page 6-4 – This states that data may be compared to background. Please provide all background data.

   Response: Text revised to state background has been included in Appendix J.

10. 6.3.1, paragraph 1, 1st sentence, page 6-9 – This references surface sediment. However, neither Section 2 nor Table 2-2 mentions any sediment samples. Please clarify this discrepancy.

    Response: Text revised because no sediment samples were collected.

11. 6.3.1, paragraph 1, 2nd sentence, page 6-9 – This references 16 surface soil samples. However, only 10 samples are shown in Tables 4-3 through 4-6. Please clarify this discrepancy.

    Response: Text revised to state "10 surface soil samples" were collected.

12. 6.3.1, paragraph 1, last sentence, page 6-9 – Please revise this to correctly reference **Tables 4-3** (as opposed to Table 4-4) **through 4-6**.

    Response: Text revised to state Tables 4-3 through 4-6.

13. 6.4.3, last paragraph, page 6-18 – Please specifically indicate which qualifiers are subject to this treatment. Also, see comments 12 and 21 of the **Risk Assessor Comments** below.

    Response: Text revised to state that this includes organics with a "J" qualifier and metals with a "B" qualifier.

14. 6.6.3, ***Residential Population Exposure Scenarios***, *Soil*, page 6-46 – Please provide all background soils data and supporting statistical evaluations.

    Response: Additional text added to Sections 6.1.2 and 6.6.3 concerning background data.

15. 6.6.3, ***Residential Population Exposure Scenarios***, *Groundwater*, 2nd bullet, page 6-46 – The Department has reviewed the document (Siudyla, E.A., May, A.E., Hawthorne, D.W., 1981; Ground Water Resources of the Four Cities Area, Virginia; Commonwealth of Virginia, State Water Control Board, Bureau of Water Control Management) referenced in this section. It is not possible to determine whether or not any of the wells used in the SWCB, 1981 study have been impacted by contamination. Therefore, the SWCB, 1981 study is not sufficient (by itself) to determine background levels for this site. The Department recommends also obtaining site-specific background data. The Groundwater Flexibilities statement and related information (previously provided to you) may provide some guidance for the development of additional lines of evidence.

    Response: This bullet was deleted because the residential scenario was deleted.

16. 7.4.1, Terrestrial Plants and Invertebrates, paragraph 1, last sentence, page 7-13 – Please correct this incomplete sentence.

    Response: Entire section has been revised.

17. 7.6.3, paragraph 2, last sentence, page 7-16 – Please provide all background data and supporting statistical evaluations.

    Response: Entire section revised.

18. 7.6.6, paragraph 1, page 7-16 – Please provide the table referenced here.

    Response: Entire section revised.

19. Figure 5-1 – This figure refers to the DOL Storage Yard. Please provide the correct figure.

    Response: Figure revised.

Risk Assessor Comments

Page 1-3, Section 1.2.2:

1. Was there any history of explosive manufacture, use or storage at this site? Dinitrotoluene was detected in the subsurface soil and could be indicative of explosives.

Response: There was no identified history at the site related to the use or storage of explosive materials. DNT is also present in polyurethane foams, dyes, and car air bags.

2. Since there was an antifreeze storage tank at the site, did any of the sampling events include analysis for antifreeze ingredients such as ethylene glycol or propylene glycol?

Response: No.

Page 6-1, Section 6.1:

3. The list of Human Health Risk Assessment (HHRA) guidance documents should also include Risk Assessment Guidance for Superfund (RAGS) Part D. The HHRA should use the standard table format presented in RAGS Part D. Not having the standard format added considerably to the review time for this project.

Response: We will strive to use the standard table format for future HHRAs.

4. The final version of RAGS, Part E (EPA, 2004) should be cited rather than the interim version.

Response: Text revised.

5. Page 6-16, Section 6.4.1: The section on groundwater indicates that no development of the Columbia Aquifer at or near the site for drinking water purposes is expected. Section 3.1.5 on page 3-9 states that several housing communities located within 1 mile west of Fort Story are

developing shallow drinking water wells in the water table aquifer. Are these communities downgradient of the 80th DRS site?

Response: Additional text has been added to this section stating that these communities are not downgradient of the site.

6. Page 6-17, Section 6.4.2: The exposure assessment should also consider the potential for vapor intrusion into buildings from contaminated groundwater.

   Response: Additional text added to Section 6.4.1 assessing the vapor intrusion scenario.

7. Page 6-19, Section 6.4.5: The ProUCL program also calculates upper confidence limits (UCLs) based on a gamma distribution. These should be used when recommended by ProUCL. In addition, ProUCL sometimes recommends a 97.5 or 99% UCL. These should be used when recommended by ProUCL.

   Response: Revised ProUCL calculations have been made and included in the revised report. The text has been revised in Section 6.4.5 to reflect the ProUCL approach.

Section 6.4.5:

8. Note that the Virginia Department of Environmental Quality (VDEQ) risk assessment guidance is updated at least twice a year. Some of the exposure factors cited in this section have been updated.

   Response: Exposure factors were revised based on a review of the risk assessment guidance provided on-line.

9. VDEQ uses total metals concentrations in risk calculations for drinking water. We don't assume that a drinking water well would always have a filter. What is the basis for that assumption?

   Response: EPA Region III document Draft Guidance on Selecting Analytical Metal Results from Monitoring Well Samples for the Quantitative Assessment of Risk, dated August 10, 1992, states that if there is a noticeable disparity between the filtered and unfiltered results (which typically is the case except for maybe essential nutrients) then the results from the filtered samples should be utilized in the risk assessment.

10. See comments below on Appendix D for comments regarding the UCL calculations.

11. Page 6-36, Section 6.5.1: Oral-to-dermal toxicity factor adjustments should be done according to RAGS Part E.

    Response: Toxicity factors have been adjusted according to RAGS Part E including the use of the GI absorption factors presented in Exhibit 4-1 of that document.

Table 6-1:

12. It is not clear why certain constituents (such as trans-1,2-dichloroethylene (DCE), methylene chloride, trichloroethylene (TCE), etc.) were included as detections on this table when all of their detections were B qualified. If the qualifiers were applied correctly (concentration less

than 10 times the blank concentration), B qualified data should not be included in the risk assessment.

Response: Agreed; however, since none of these compounds were identified as COPCs for soil, their inclusion is inconsequential.

13. The EPA Region III Residential risk-based concentration (RBC) for Acenaphthene should be 470,000 µg/kg. Acenaphthene does not need to be retained as a contaminant of potential concern (COPC). The RBC for anthracene should be 2,300,000 µg/kg. Anthracene does not need to be retained as a COPC.

Response: Table changed.

14. The residential RBC for dibenzo(a,h)anthracene should be 87 µg/kg. Dibenzo(a,h) anthracene should be retained as a COPC.

Response: Table changed.

15. The residential and industrial RBCs for chromium should be 23 and 310 mg/kg, respectively.

Response: Table changed.

16. According to Table 4-6, the maximum concentration of mercury should be 0.035 mg/kg.

Response: Table changed.

17. The residential and industrial RBCs for vanadium should be 7.8 and 100 mg/kg, respectively. Vanadium should be retained as a COPC.

Response: Table changed.

Table 6-3:

18. It is not clear why the detection of 11 µg/L cis-1,2-DCE in MW-9 was not included as the maximum concentration in groundwater. Cis-1,2-DCE should be a COPC since the maximum concentration exceeds the RBC.

Response: Table changed.

19. The RBC for tetrachloroethylene (PCE) should be 0.1 µg/L. The RBC table is updated twice a year. The most recent version of the RBC table should be used.

Response: Table changed.

20. It is not clear why the detection of 7.5 µg/L TCE in MW-9 was not included as the maximum concentration in groundwater.

Response: Table changed.

21. It is not clear why the detections of toluene and 1,2,4-trichlorobenzene were included on this table since all of the detections had B qualifiers. If the qualifiers were applied according to

the 10X rule (concentration less than 10 times the blank concentration) B qualified data should not be included in the risk assessment.

Response: Agreed; however, since none of these compounds were identified as COPCs for groundwater, their inclusion is inconsequential.

22. The EPA carcinogen class for mercury (mercuric chloride) should be C.

Response: Table changed.

23. The EPA RBC for vanadium should be 3.7 µg/L.

Response: Table changed.

24. Table 6-9: The fraction ingested (FI) for the industrial worker should be 1.

Response: Revision made.

25. Table 6-10: The skin surface area (SA) for the industrial worker should be 3300 cm^2.

Response: Revision made.

26. Table 6-13: The SA for the child resident should be 2800 cm^2.

Response: The risk assessment has been revised and does not include residential exposures.

27. Table 6-24 and 6-25: See RAGS E for current guidance on adjustment of toxicity factors for dermal exposure assessment. It appears that some adjustments have been made that weren't required.

Response: Revisions have been made to the adjustments based on RAGS Part E.

28. Table 6-33: I was not able to verify the oral carcinogenic risk estimates for residents. I was not able to determine the source of the discrepancy.

The risk assessment has been revised and does not include residential exposures.

Appendix D,UCL Calculations

29. Note that UCLs only need to be calculated for contaminants that exceed screening values.

Response: Comment noted.

Groundwater

30. ProUCL recommends a UCL of 2.631 mg/L for iron based on a gamma distribution.

31. ProUCL recommends a UCL of 0.0034 mg/L for dissolved arsenic using the modified t method.

32. ProUCL recommends a UCL of 2.3 mg/L for dissolved iron based on a gamma distribution.

33. ProUCL recommends a UCL of 0.09 mg/L for dissolved manganese based on a gamma distribution.

Response: ProUCL revisions for comments #30 – 33 have been made.

Soil

34. The surface soil concentration of Benzo(b)fluoranthene in SB-1 should be 240 µg/kg rather than 140 µg/kg according to Table 4-4. The UCL should be 6.2 mg/kg based on a non parametric distribution.

    Response: Revisions made.

35. The surface soil concentration of indeno(1,2,3-cd)pyrene in SB-1 should be 150 µg/kg rather than 75 µg/kg according to Table 4-4. The UCL should be 3.1 mg/kg based on a gamma distribution.

    Response: With the removal of the residential scenarios, the UCL for indeno did not need to be calculated since its max concentrations did not exceed the industrial RBC value.

36. The surface soil concentration of aldrin in SB-3 should be 43 µg/kg rather than 0.43 µg/kg according to Table 4-5. The UCL should be 0.067 mg/kg based on a non parametric distribution.

    Response: With the removal of the residential scenarios, the UCL for aldrin did not need to be calculated since its max concentrations did not exceed the industrial RBC value.

37. The surface soil UCL for aluminum should be 5632 mg/kg based on a gamma distribution.

    Response: With the removal of the residential scenarios, the UCL for aluminum did not need to be calculated since its max concentrations did not exceed the industrial RBC value.

38. The surface soil UCL for iron should be 6670 mg/kg based on a gamma distribution.

    Response: With the removal of the residential scenarios, the UCL for iron did not need to be calculated since its max concentrations did not exceed the industrial RBC value.

39. Results that were qualified JB were not treated consistently. For example in the combined soils data set for benzo(a)anthracene the full value (140 µg/kg) was used for MW-7 while ½ the detection (150 µg/kg) was used for MW-8. As noted above, B qualified data are generally not included in quantitative risk assessment. However, if they are used they should be treated consistently.

    Response: The full value for B qualified COPCs has been used in the revised assessment.

40. For benzo(a)anthracene and benzo(a)pyrene the summary statistics indicate that the number of samples in the data set was 10. However 30 data points are shown. This discrepancy should be corrected or explained.

    Response: This has been corrected.

41. For the benzo(b)fluoranthene combined soil data set the concentration in SB-1 should be 240 µg/kg rather than 120 µg/kg, the concentration in SB-4 should be 2000 µg/kg rather than 200 µg/kg and the concentration in SB-5 should be 3400 µg/kg rather than 2400 µg/kg. My calculations resulted in a UCL of 4.4 mg/kg based on a non parametric distribution.

    Response: Correction made.

42. For the indeno(1,2,3-cd)pyrene combined soil data set the concentration in SB-1 should be 150 µg/kg rather than 75 µg/kg. My calculations resulted in a UCL of 2.3 mg/kg based on a non parametric distribution.

    Response: Indeno has been removed from the analysis because it did not exceed the industrial RBC value and no residential scenario was assessed.

43. In some cases ProUCL recommends a 99% UCL rather than a 95% UCL. It appears that the 95% UCL was selected regardless of the ProUCL recommendation. For example, the 99% UCL for aldrin in the combined data set should be 0.036 mg/kg based on the ProUCL recommendation. The UCL for aluminum should be 4884 mg/kg based on the ProUCL recommendation.

    Response: Revised ProUCL outputs included.

REVISED DRAFT

REMEDIAL INVESTIGATION REPORT
80TH DIVISION RESERVE SITE

Installation Restoration Program
Fort Story, Virginia

U. S. Army Transportation Center
Fort Eustis, Virginia

and

U.S. Army Corps of Engineers
Baltimore District

April 2007

0285-917