10/3/05-02450

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CARIBBEAN ENVIRONMENTAL PROTECTION DIVISION
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October 3, 2005

Mr. Jeffrey Harlow
Western Vieques Remedial Project Manager
Commander Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Re: Review of the Draft Remedial Investigation Report for AOC H at the Former US Naval Ammunition Support Detachment (NASD) Vieques Island, Puerto Rico

Dear Mr. Harlow:

The U.S. Environmental Protection Agency (EPA) and the Puerto Rico Environmental Quality Board (EQB) have completed the review of the Draft Remedial Investigation Report for AOC H, Former Power Plant, dated April 2004. Enclosed you will find our comments.

If you have any questions or comments, please contact me at (787) 741-5201.

Sincerely yours,

Daniel Rodriguez
Remedial Project Manager
Enforcement and Superfund Branch

Enclosures (2)

cc: Yarissa Martinez, EQB, w/ encl.
Felix Lopez, FWS, w/ encl.
Oscar Díaz, FWS, w/encl.
Brett Doerr, CH2M Hill, w/encl.

EPA's Comments
Draft Remedial Investigation Report
Area of Concern (AOC) H
Former Naval Ammunition Support Detachment
Vieques, Puerto Rico
April 2004

1. All detections of anthropogenic compounds need to be included on the summary tables, as well as displayed on a figure. This applies to all media and depth horizons.

2. Executive Summary, Nature and Extent of Chemical Distribution at AOC H, page ES-2: This discussion should include sediment and surface water data results.

3. Executive Summary, Ecological Risk Assessment, page ES-4: The potential risks associated with the surface water and sediment data should be included in this section, along with the discussion of soil contaminants.

4. Section 1.1, Purpose and Scope, page 1-1: The description of work conducted at the site indicates that measurements were collected at a nearby stream to establish baseline static groundwater levels in the vicinity of AOC H. In Section 2.3.2 Topography (page 2-2) there is a description of a "creek." In order to avoid confusion, the same terminology should be used throughout the document. As agreed on previous documents, the drainage ditch should be called an ephemeral stream throughout the document. If the ephemeral stream and the creek are indeed different water bodies then it should be noted whether these areas were sampled for chemical contaminants.

5. Section 2.1, Location, page 2-1: The RI notes the Site is located 500 feet of Vieques Passage (portion of Atlantic Ocean separating Vieques Island from Puerto Rico) but on Page 3-6, the RI notes that the northern border of AOC H is approximately only 100 feet from Vieques Passage. This discrepancy needs to be corrected.

6. Section 2.3.5.1, Surface Water, page 2-3: It is noted that a water-filled ditch is located just west of the building and is mostly stagnant. However, during periods of heavy and prolonged rainfall the mouth of the stream opens to Vieques Passage to the north. Further, a tidal study indicted that water levels in the ditch are not influenced by tides (Section 3.2.8 Tidal Fluctuation Study, page 3-7), but rainfall events. This seems to be in conflict with the description provided in the executive summary which indicates that the ditch contains tidal water from Vieques Passage. This inconsistency should be corrected.

7. Section 2.3.5.2, Groundwater, page 2-4: At the western part of the site groundwater may flow locally to the west toward the water-filled ditch. This should be reflected in Figure 5-1 Conceptual Site Model; there should be a groundwater to surface water pathway.

8. Section 2.3.5.2, Groundwater, page 2-4: The text references Appendix D for gradient calculations, but theses are not included in the Appendix. Please resolve.

9. Figure 2-6, Groundwater Flow Map: The key wrongly indicates that the contour intervals are 1 and 10 feet. Please amend. Also, the stilling well should be shown on this map, hopefully with a water level collected with those from the monitoring wells.

10. Section 3.2.1, Monitoring Well Installations, page 3-3: The report indicates that stratigraphy at monitoring well locations were logged from the drill cuttings. This is contrary to the work plan which indicated that split spoons would be collected. It seems likely that it is also part of the reason that MW-6 was drilled too deep, with the screen set below that of other wells. In the future, please follow the work plan. Drill logs for the wells are also missing from the referenced appendix and should be added.

11. Section 3.2.1, Monitoring Well Installations, page 3-3: Rather than indicating that drill cuttings and IDW were disposed of according to the Master Work Plan, indicate what was actually done with them. If any sampling of the cuttings took place, include those results.

12. Table 3-3, Summary of Well Construction Details: Well construction tables should include data from all of the wells at the site, not just the new ones. Please amend.

13. Page 4-3, The text states that perchlorate was not detected in any of the groundwater samples collected at AOC H. However, the footnote on Page 6-31 states that perchlorate was detected once during the 2000 sampling event. Please verify the perchlorate results and revise the document accordingly.

14. Section 4.1.4, Regulatory, Health-Based, and Ecological Screening Levels, pages 4-4 - 4-5: The RI notes that sediment results were compared to screening values presented in either *Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments* (Long, 1995) or the *EPA memorandum Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities and Inclusion of Stakeholders* (USEPA, 2000). A copy of the latter document should be provided to us; it is unclear whether actual sediment screening criteria are provided in this document. In addition, there should be a discussion of screening criteria used for surface water samples. It should be noted that the lower of the *USEPA National Recommended Water Quality Criteria* (USEPA, 2002) and the *Puerto Rico Environmental Quality Board (EQB) Water Quality Standards* were used for surface water, as noted in Table 4-7 (Detected Chemicals Above Criteria and Background in Surface Water).

15. Section 4.1.4, Regulatory, Health-Based, and Ecological Screening Levels, pages 4-4: Soil screening for impact to groundwater should use the default DAF of 1. As stated in the SSL guidance, the use of a DAF 20 is generally not appropriate for sites where the water table is quite shallow. The DAF of 10 used for subsurface soils is suggested without any reasoning as to why this is appropriate. Site specific numbers other than DAF 20 and DAF 1 are

sometimes calculated; this does not appear to have been done here to arrive at the DAF 10 value. In the future, the Navy and the agencies should agree beforehand what criteria will be used.

16. Section 4.2.1.4, Sediment, page 4-7: In general, it is recommended that a range of background samples be collected, rather than just one sample. The uncertainty of comparing site data to one background sample should be addressed in the uncertainty section.

17. Table 4-8, Detected Chemicals Above Criteria and Background in Sediment, page 4-30: The footnote indicates that the lower of the screening criteria for marine and estuarine sediments (Long, 1995) or the USEPA Guidance on Ecological Risk Assessment (USEPA, 2000) were used to screen sediment and presents a value of 20 mg/kg for barium. It is unclear where this value came from as there is no value for barium in Long, 1995 and Table 7-13 (Step 2 Screening Statistics and COPC Selection - AOC H -Sediment) indicates that there is no screening value available for barium. This discrepancy should be clarified.

18. Table 4-9, Summary of Surface Soil COPCs, page 4-31: Please indicate what the shaded boxes represent.

19. Section 4 Figures: It would have been useful to indicate, perhaps with a different shading, which samples had ecological exceedances and which had human health exceedances.

20. Tables 5-1 and 5-2: These tables should be presented with the other site data. Table 5-2 should include all of the field parameters that were measured. A table of field parameters for the surface water sampling should also be included (or these could be added to Table 5-2).

21. Section 5.4.4.2, Soil to Groundwater Contaminant Migration, page 5-11: The second bullet states that turbidity and specific conductance were lower in the background well compared to the site wells. In fact, Table 5-2 shows that the well had the highest turbidity and that one site well had lower conductance. Furthermore, it is not clear how higher salinity (which is inferred for some wells) is tied to metals concentrations.

22. Section 6.5.1, COPC Selection for Human Health Risk Assessment, Bullet 1, page 6-5: Please update the Region 9 PRG table values. The Region 9 table was updated most recently in October 2004.

23. Section 6.5.1, COPC Selection for Human Health Risk Assessment, Bullet 3, page 6-5: Considering the depth to groundwater is 7 ft in some areas, it may not be appropriate to use a DAF of 10 when evaluating the potential of contaminants for migration to groundwater. Please consult with a hydrogeologist to identify the most appropriate DAF.

24. Sections 6.6.1, Potentially Exposed Populations, and Section 6.6.2, Exposure Route

Factors: Exposure parameter information is presented in both sections. This information is somewhat confusing. Please revise these sections to more clearly identify the exposure parameters for each population and pathway.

25. Section 6.6.1, Potentially Exposed Populations, page 6-7: Please identify the age of the recreational youth receptor.

26. Section 6.6.1.3, Industrial Workers, page 6-9: Please revise the soil ingestion rate for the industrial worker to 100 mg/day, which is the recommended value for workers who will be outside for a portion of their workday. The reference for this value is the "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites" (OSWER 9355.4-24).

27. Section 6.6.2.9, Surface and Subsurface Soil Inhalation, page 6-11: The PEF value used is the default value. Please calculate and use a site-specific PEF value that more closely represents the size of the site and the physical characteristics of the site. Also, please clarify if one PEF will be used for both surface soils and subsurface soils (for construction activities).

28. Section 6.6.3.2, Exposure Point Concentration, page 6-12: Please note that the latest version of the ProUCL tool is version 3.00.02 and is available at: http://www.epa.gov/nerlesd1/tsc/form.htm

29. Section 6.7, Toxicity Assessment, page 6-12: A list of chemicals for which toxicity values are not available from the IRIS database was sent to EPA ORD/NCEA for review. The following chemicals now have updated recommendations:
    A. Aluminum: The NCEA provisional value has been withdrawn pending further review; please address this chemical qualitatively.
    B. Iron: The NCEA provisional value has been withdrawn pending further review; please address this chemical qualitatively.
    C. Vanadium: Please use the chronic RfD recommended in the 1997 HEAST document.
    D. Benz[a]anthracene: Please use the same TEF scale for the inhalation unit risk values for b[a]a and benzo[a]pyrene as was used for the oral slope factor. The reference for this approach is NCEA.

30. Tables 6-1, 6-2, and 6-3: The repeated detections of Thallium at estimated concentrations suggest that a more sensitive analytical method should be considered. A more sensitive method would likely reduce the chance of false positives being reported.

31. Section 7.2.1.1, Environmental Setting, Exposure Pathways and Routes, page 7-4: It is noted that the ditch is supportive of aquatic plant (mangroves). However, Section 7.2.1.3 Preliminary Conceptual Model, Exposure Pathways and Routes, page 7-7, indicates that no fully aquatic plants were observed in the water-filled ditch. This statement should be clarified as it appears to be in conflict with previous descriptions of stream's vegetation.

32. Section 7.2.1.1, Environmental Setting, Fauna, page 7-5: The RI fails to discuss the fauna associated with the water-filled ditch. This information is needed to adequately evaluate the species selected for exposure modeling in the ERA.

33. Section 7.2.1.1, Environmental Setting, Receptors, page 7-8: To better evaluate sediment contaminants, more appropriate receptors may be fiddler crabs, land crabs, and night herons. It should be noted that fiddler crabs were used at other SWMUs to evaluate the bioavailability of contaminants.

34. Section 7 Tables: A table should be added to Section 7 which identifies COCs for fish based on sediment and surface water values, and/or food web models, as appropriate.

35. Table 7-4, Preliminary Assessment Endpoints, page 7-27: Using sediment screening values for protection of fish may not be appropriate as this does not take into consideration bioaccumulation of contaminants or the concentrations of contaminants in surface water. Further, there should be assessment endpoints for surface water.

36. Tables 7-14 & 7-23 *Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 2 & Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 3*: The calculations used to determine the dietary ingestion values to support this table, should be provided in an Appendix or in Section 7

37. Section 8.1.2.1, Surface Soil, Organic Chemicals, page 8-2: The text references Table 4-4 for the concentrations of VOCs in surface soil. The table includes xylene, but the 1,1-DCE detection is not shown. Please correct.

38. Section 8.1.2.2, Subsurface Soil: The subsection on organic chemicals appears to be missing from this section.

39. Appendix J: The RAGS D Table 2 Series is missing. Please include this series of tables.

40. Appendix J, Table 3 Series: Please note that the latest version of the ProUCL tool is version 3.00.02.

EQB's Technical Comments

Draft Remedial Investigation Report
Area of Concern (AOC) H
Former Naval Ammunition Support Detachment
Vieques Island, Puerto Rico
April 2004

I. INTRODUCTION

TRC has reviewed and provides the attached comments to the Draft Remedial Investigation Report for Area of Concern (AOC) H, dated April 2004.

The RI Report presents the results of the Remedial Investigation (RI) conducted for AOC H of the former Naval Ammunition Support Detachment (NASD) in the western portion of Vieques Island, Puerto Rico. The RI activities were detailed in the Final Remedial Investigation/Feasibility Study Work Plan for Solid Waste Management Unit (SWMU) 6, SWMU 7, Area of Concern (AOC) H, and AOC J, July 2003. TRC had provided to Puerto Rico Environmental Quality Board (EQB), on April 15, 2003, technical comments on the Draft Remedial Investigation/Feasibility Study Work Plan for Solid Waste Management Unit (SWMU) 6, SWMU 7, Area of Concern (AOC) H, and AOC J, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico, dated February 21, 2003. The comments were provided by P.R. EQB to Naval Facilities Engineering Command on April 21, 2003 who finalized the RI Work Plan considering the comments.

The AOC H RI Report finds that the site conditions at AOC H do not pose an unacceptable risk to human health or ecological receptors based on an unrestricted land use. As a result, no remedial actions were recommended by the Navy for the site. This review notes a number of uncertainties, typographical errors, and other issues associated with the report.

Page-Specific Comments

1. Page ES-1, Paragraph 1 – The last sentence should be revised for consistency with the text. The last sentence indicates that the drainage ditch contains tidal water; however, text on Page 2-4, Paragraph 1 and Page 3-7, Paragraph 2, and Figure 3-5 all indicate there is no tidal influence.

2. Page ES-2, Paragraph 7 – Clarify if the total (unfiltered) metals samples were collected using United States Environmental Protection Agency (EPA) Region II low stress/low flow sampling procedures.

3. Page 2-1, Paragraph 3 – The acronym "PWA" is not identified in the Acronyms and Abbreviations list on pages VII through XII. Provide a definition for the acronym.

4. Page 2-4, Paragraph 3 – Provide the gradient calculations as described in this paragraph. Appendix D, which was cited as the location of the gradient calculations, contains only the groundwater sampling data sheets.

5. Page 2-5, Section 2.6 – Include the depths of surface and subsurface soil samples collected during the Expanded PA/SI since these samples were evaluated in the HHRA. The text should clarify the method/technique used to collect the four (4) surface soil samples inside the building.

6. Pages 2-5 and 2-6, Section 2.6 –
   a. Clarify that the PRGs used are the Region 9 PRGs.
   b. Clarify what screening criteria were used to compare soil contaminant concentrations.

7. Figure 2-2 – Typographic Error. Correct the spelling of "Puerto Rico Conservation Trust" in the legend of this figure.

8. Figure 2-6 – The orientation of the groundwater contours indicate that there is no groundwater data downgradient from the majority of the powerplant building (i.e., along the west side of the building, between the building and the ditch). The RI Report must discuss this as a possible data gap. The report must propose corrective action to address this data gap (i.e., installation of more wells). The monitoring wells should be identified in Figure 2-6. The stilling well should be located in Figure 2-6 and the water elevation data displayed and incorporated into the contour lines.

9. Page 3-1 and 3-2, Section 3.1.2 - The text should discuss the depths at which subsurface soil samples were collected and the rationale for selecting those depths.

10. Page 3-5, Paragraph 1 – Note that the range of purging rate exceeds the upper end of the flow rate recommended in the EPA Region II Groundwater Sampling Procedure, Low Stress (Low Flow) Purging and Sampling (GW Sampling SOP Final March 16, 1998). Explain why flow rates in excess of those recommended by EPA low stress (low flow) guidance were used. EPA Region II and the EQB prefer the low flow (low stress) purging and sampling procedure.

11. Figures 3-1 to 3-3 - The locations of former transformers, generators, and ASTs inside and outside the building provide information on areas where historical leaks or spills may have occurred. Also, the location of floor drains, if any, and exterior doors are also indications of where releases may have occurred. Provide this information on these figures and include a discussion in the text that identifies the location of these potential sources and the samples collected to determine if releases may have occurred. If this information is not available, that should be clarified in the report.

12. Page 4-2, Paragraph 1 - Typographical Error. Correct the reference "EPA, 1999" to read "EPA, 1999a" to be consistent with the reference citation in Section 9 (References).

13. Page 4-4, Secion 4.1.4 – The text should include a consideration of the applicability of the following standards and criteria:
    a. EPA has published interim final ecological soil screening levels (eco-SSLs) that should be used as the primary reference for ecological screening values, followed by the references provided in this section if an appropriate eco SSL value is not available.
    b. Subsurface soils should be screened using residential PRGs to ensure that the residential exposure scenario for subsurface soil evaluated in the human health risk assessment (HHRA) includes all chemicals exceeding residential screening criteria. If the list of contaminants changes as a result of this screening, the risks to residential receptors should be reevaluated in the risk assessment and submitted for regulatory review and approval prior to finalizing this report.
    c. MCLs, in some cases, are not risk-based. Therefore, risk-based PRGs should be calculated for those chemicals for which EPA Region 9 did not calculate a value rather than using the MCL as a screening value. EPA Region 9 provides the methodology and equations used to calculate PRGs in their technical memorandum, *Region 9 PRGs Table 2002 Update,* dated October 1, 2002.

14. Page 4-4, Section 4.1.4, Bullet 1 - Typographical Error. Correct the reference "EPA (2002)" to read "EPA (2002d)" to be consistent with the reference citation in Section 9 (References).

15. Page 4-4, Section 4.1.4, Bullet 2 –
    a. The use of industrial worker screening levels for subsurface soil is inconsistent with the site conceptual model presented in Figure 5-1, which contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil and does not identify industrial workers as potentially exposed receptors. Consequently, screening the subsurface soils with the less conservative industrial worker screening levels may not be sufficiently protective. Provide a justification for using the industrial PRGs that demonstrates that they are sufficiently protective for screening purposes given the receptors identified in the conceptual model, or use the residential PRGs for subsurface soil screening, which address dermal contact, ingestion, and inhalation of fugitive dust and should be protective of construction worker exposures.
    b. Provide the rationale for using a DAF of 10 for the SSLs.

16. Page 4-4, Section 4.1.4, Bullet 4 – Correct the citation "Long, 1995" to "Long et al, 1995" to be consistent with the reference citation in Section 9 (References). The text should explain the rationale for not referencing the NOAA SQuiRT tables.

17. Page 4-5, Section 4.1.4 – Correct the citation "(EPA, 2000)" to "(EPA, 2000a)" to be consistent with the reference citation in Section 9 (References).

18. Page 4-5, Section 4.1.4, Bullet 1 - Typographic Error. Correct the reference "EPA (1991)" to read "EPA (1991a)" to be consistent with the reference citation in Section 9 (References).

19. Page 4-6, Section 4.2.1 – The text should discus the representativeness of the facility-wide background data used for comparison to site data for soil. Data should be used that has been collected from similar soils (e.g., same soil horizon and soil type).

20. Page 4-7, Section 4.2.1.5, Paragraph 5 – Typographic Error. Correct the reference "(EPA, 1989)" to read "(EPA, 1989b)" to be consistent with the reference citation in Section 9 (References).

21. Page 4-7, Section 4.2.1.4 – The text should present limitations based on the limited (one sample) sediment data set. The rationale for appropriateness of corrective actions should be discussed.

22. Page 4-9, Paragraph 1 – Typographic Error. Correct the reference "(EPA, 1989)" to read "(EPA, 1989b)" to be consistent with the reference citation in Section 9 (References).

23. Page 4-9, Paragraphs 5 through 10 – Typographic Error. Correct the reference "(CH2M HILL, 2002)" to read "(CH2M HILL, 2002b)" to be consistent with the reference citation in Section 9 (References).

24. Page 4-10, Section 4.2.2.1 – The text states that an SSL was not available for benzo(a)pyrene. However, Table 4-4 shows an SSL of 4 mg/kg for benzo(a)pyrene. Please clarify.

25. Page 4-11, Section 4.2.2.1 – A discussion should be provided on the PCB Aroclor analyses performed on subsurface soils.

26. Page 4-10, Section 4.2.2.1, Page 4-11, Section 4.2.2.1, and Page 5-7, Section 5.4.2.4 – The text should be revised for consistency. Page 4-10 and Page 5-7 indicate that 2,6-DNT was detected in surface soil. Page 4-11 states that explosives were not detected in surface soil samples.

27. Pages 4-11 and 4-12, Section 4.2.2.2 –
    a. As previously discussed, the use of industrial worker screening levels for subsurface soil is inconsistent with the site conceptual model presented in Figure 5-1, which contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil and does not identify industrial workers as potentially exposed receptors. Screening the subsurface soils with the less conservative industrial worker screening levels may not be sufficiently protective. Justify the use of the industrial PRGs and demonstrate that they are sufficiently protective for screening purposes, or use the residential PRGs for subsurface soil screening, which should be conservatively protective of construction worker exposures.
    b. If the residential PRGs are used for screening, additional compounds will be included in the discussion of the nature and extent of contamination, fate and

transport, and human health risk assessment, such as lead, vanadium, DDD, and DDE.

28. Page 4-11, Paragraphs 8 and 9 – Typographic Error. Correct the reference "(CH2M HILL, 2002)" to read "(CH2M HILL, 2002b)" to be consistent with the reference citation in Section 9 (References).

29. Page 4-12, Section 4.2.2.3 – It is unclear why only one filtered sample is presented in Table 4-6 for cadmium if three filtered samples exceed the PRG and background for cadmium, according to the text in this section.

30. Page 4-12, Paragraph 8 – Clarify that the PRG used for comparison was the tap water PRG for hexavalent chromium.

31. Table 4-1 –
    a. Explain the occurrence of toluene (1.3 ug/L) and caprolactam 3 J (ug/L) in background groundwater.
    b. Typographic error. The footnote for "=" has an incorrect spelling for "indicates."
    c. The table has an incorrect spelling for Aroclor (the "h" should be deleted).

32. Table 4-2 – Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

33. Table 4-4 –
    a. Typographic error. Correct the spelling of the word "factor" in footnote "3."
    b. Typographic error. The footnote for "=" has an incorrect spelling for "indicates."
    c. See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

34. Table 4-4 - There are two concentrations listed for zinc at the same location both sampled in December 2000. Affected samples include NDAHSS01, NDAHSS02, and NDAHSS09. In addition, on Figure 4-1, the lower of the two results was reported for NDAHSS01 and NDAHSS02. Please clarify why there are two values reported on the same date collected and why the lower of the two values is included on Figure 4-1 for 2 of the 3 samples affected.

35. Table 4-5 –
    a. Typographic error. The footnote for "=" has an incorrect spelling for "indicates."
    b. The SSL is not suitable as the sole basis for screening subsurface soil. The site conceptual model presented in Figure 5-1 contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil. Screening the subsurface soils with the less conservative SSLs may not be sufficiently protective. Justify the use of the SSL as the sole comparison criterion or include the residential PRGs for subsurface soil screening.
    c. See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

36. Table 4-6 – Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

37. Table 4-7 - Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

38. Table 4-8 - Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

39. Table 4-9 –
    a. Typographic error. Correct the spelling of the word "factor" in footnote "4."
    b. See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

40. Table 4-10 –
    a. Typographic error. Correct the spelling of the word "factor" in footnote "3."
    b. The SSL is not suitable as the sole basis for screening subsurface soil. The site conceptual model presented in Figure 5-1 contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil. Screening the subsurface soils with the less conservative SSLs may not be sufficiently protective. Justify the use of the SSL as the sole comparison criterion or include the residential PRGs for subsurface soil screening.
    c. See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

41. Table 4-11 - Clarify that the PRG used for comparison was the tap water PRG for hexavalent chromium.

42. Table 4-11 –
    a. The site-specific background concentration for dissolved antimony should be ND (not 95 ug/L), according to Table 4-1.
    b. The site-specific background concentrations for total and dissolved chromium should be reversed, according to Table 4-1.
    c. The site-specific background concentration for p,p'-DDD should be ND not NA, as this compound was analyzed for in the background sample, according to Table 4-1.

43. Table 4-12 - Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

44. Figure 4-9 – All of the sediment locations should be labeled.

45. Page 5-2, Section 5.2, Paragraph 2 and Figure 2-6 – The depth of the ditch should be provided.

46. Page 5-2, Section 5.2, Paragraph 3 – The text should identify which screening criteria were exceeded for soil (i.e., industrial PRGs or SSLs).

47. Page 5-5, Section 5.4.2.1, Paragraph 2 – The "ATSDR, 1995" reference in this paragraph appears to be in error because it does not match those provided in the references (Section 9). The reference section includes ASTDR references from a number of dates, including 1995, which refers to a toxicological profile for polycyclic aromatic hydrocarbons (PAHs). The appropriate ATSDR profile for xylenes is not listed in the reference section.

48. Page 5-6, Section 5.4.2.2, Paragraph 2 – Provide references, where appropriate, for the information concerning n-nitrosodi-n-propylamine origins, fate and transport properties, etc.

49. Page 5-6, Paragraph 5 – The citation "Howard, 1991" should be "Howard et.al., 1991" to be consistent with the citation in Section 9 (References).

50. Page 5-6, Paragraph 6 and Page 5-7, Paragraph 1 – Provide references, where appropriate, for the information concerning PAH metabolism, etc., in these paragraphs.

51. Page 5-7, Paragraph 3 – Provide references, where appropriate, for the information concerning the fate and transport characteristics of chlorinated pesticides.

52. Page 5-7, Paragraph 4 – Provide references, where appropriate, for the information concerning the fate and transport characteristics of 2,6-DNT.

53. Page 5-7, Paragraph 5 – See Comment to Page 4-4, Bullet 2 regarding the suitability/protectiveness of the screening criteria applied to subsurface soil. Additional compounds may warrant discussion if other screening criteria are applied (e.g., residential soil PRGs).

54. Page 5-8, Paragraph 2 - Provide references, where appropriate, for the information concerning metals mobility, complexes, hard and soft electron fields, etc. in this paragraph.

55. Page 5-9, Paragraphs 4 and 5 - Provide references, where appropriate, for the information concerning the fate and transport characteristics of iron and manganese.

56. Page 5-9, Paragraph 6 - Provide references, where appropriate, for the information concerning the fate and transport characteristics of thallium.

57. Page 5-9, Paragraphs 7 and 8 - Provide references, where appropriate, for the information concerning the fate and transport characteristics of arsenic and vanadium.

58. Page 5-11, Last Sentence – The text indicating the occurrence of limited migration should be expanded to detail which constituents are migrating and the extent of migration.

59. Table 5-4 –
    a. The sources "d" (Spectrum Laboratory) and "e" (Mackay et al., 2000) are not used in this table and should be deleted.
    b. The acronyms "VOC" and "SVOC" should be spelled out in the footnotes.

60. Figure 5-1 –
    a. EPA 2001 describes the Construction Worker as a short-term receptor who is exposed to soil contaminants during the workday for the duration of a single construction project (typically a year or less). The activities for this receptor typically involve substantial on-site exposures to surface and subsurface soils. The construction worker is expected to have a very high soil ingestion rate. EPA assumes the Construction Worker to be exposed to contaminants via the following direct and indirect pathways: incidental soil ingestion, dermal absorption, inhalation of volatiles outdoors, and inhalation of fugitive dust. Consequently, the Conceptual Site Model should identify the Construction Worker as a potential human receptor for surface soil.
    b. The conceptual site model should include residential exposures to subsurface soil. Future residents could become exposed to subsurface soils through a variety of mechanisms, including excavations for residential building foundations.
    c. The conceptual site model should evaluate the potential future residential exposure scenario. Therefore, remove "?" marks and the definition of this mark from Figure 5-1.
    d. Figure 5-1 should be consistent with the CSM presented in the risk assessment reported in Appendix J. The CSM in Appendix J evaluates the potential future residential pathway for surface soil, and evaluates ingestion and dermal exposure for subsurface soil.
    e. A resident could be exposed to surface water and sediment. Therefore, the risk assessment should evaluate ingestion and dermal contact with surface water and sediment as potentially complete exposure pathways.
    f. For the future residential exposure scenario, clarify why root uptake of metals and subsequent ingestion in home-grown vegetables is not a pathway of concern for this site.
    g. Dermal contact and incidental ingestion of groundwater is a complete exposure pathway for construction workers, as groundwater is located above development depth (i.e., 10 feet bgs).

61. Page 6-1, Section 6.1, Paragraph 1 - The location of this site near a roadway and the presence of a building on-site also support the assumption that this site could be residential in the future. The statement that the residential exposure scenario is included simply for comparison is misleading. Unless it can be demonstrated that a residential exposure scenario is not a potential future use of this site, this statement along with the statement that the features at the site preclude residential use should be removed here and elsewhere in the report as appropriate.

62. Page 6-5, Section 6.5.1, Paragraph 2 - As stated previously, subsurface soils should be screened using residential PRGs. If additional contaminants are identified as

contaminants of potential concern for the residential exposure scenario for the risk assessment, risks associated with exposure to contaminants in subsurface soil should be re-evaluated.

63. Page 6-5, Section 6.5.1, Third Bullet - The second sentence is unclear. If the migration to groundwater SSLs were used to eliminate chemicals from evaluation in the risk assessment, then an additional screening should be done to confirm that the migration to groundwater SSL is more conservative than the residential PRG for each chemical that was screened out.

64. Page 6-5, Section 6.5.1, Paragraph 7 - Provide further discussion in the text on the applicability of facility-wide background surface water data to site surface water. Include a discussion on the water chemistry of the surface water samples used for background and site surface water (e.g., specific conductance, pH, salinity, turbidity).

65. Page 6-7, Section 6.6.1, Paragraph 4 - Clarify whether the 1997 updated *Exposure Factors Handbook* or the 1991 version was used as a reference for exposure parameter data. The 1997 reference is listed in Section 6.1.

66. Page 6-8, Section 6.6.1.2, First Paragraph - The second sentence states that subsurface soil samples were collected from 0.5 to 10 feet bgs. However, it appears that subsurface soil samples were consistently collected from 4 to 6 feet bgs. As requested earlier, provide further discussion on the depths at which subsurface soil samples were collected, the rationale for selecting that depth, and whether these soils are representative of subsurface conditions from 0.5 to 10 feet bgs.

67. Page 6-8, Section 6.6.1.2, Paragraph 2 - The assumption that inorganics do not have the potential to transfer through the skin is not consistent with current EPA guidance on evaluating dermal exposure (RAGS Part E). This guidance states that "...the skin has a limited capacity to reduce the transport rate of inorganic and/or highly ionized organic chemicals. In addition, the viable epidermis will contribute insignificantly as a barrier to these chemicals..." This guidance presents specific methodology for evaluating dermal exposure to inorganics in water. Therefore, the risks associated with this exposure pathway should be quantified for all applicable receptors.

68. Page 6-9, Section 6.6.1.4 - This paragraph states that the recreational receptor was assumed to visit the site both days of the weekend, 104 days per year. However, the risk assessment evaluates exposure to surface water and sediments for only 52 days per year. The risk assessment should be corrected to represent the number of days of exposure presented in the text.

69. Page 6-11, Section 6.6.2.9 - The default PEF is not applicable to construction worker exposure to particulates. The same draft EPA guidance referenced in this section also provides the equation for calculating a PEF applicable to the construction worker exposure scenario.

70. Page 6-13, Section 6.8 - As stated in EPA's Response to Comments on the National Contingency Plan (EPA, 1990), EPA's preference is to set cleanup levels at the more protective end of the risk range. However, site-specific or remedy-specific factors will enter into the determination of where within the risk range the cleanup standard for a given contaminant will be established. EPA further states that as risks increase above 10^{-6}, they become less desirable. Therefore, the third sentence is misleading and should be eliminated. It is inappropriate to have risk management opinions stated in this section of the HHRA. The second and third paragraphs should be moved to Section 6.10. Section 6.8 should describe the methodology used in developing risk estimates and present those risk estimates. Section 6.10 is dedicated to comparing site data to background.

71. Page 6-14, Section 6.8, current maintenance worker - The risk estimate is within the risk range, not below the risk range. Correct the text here and elsewhere as appropriate. The risk to an overall residential receptor representing 30 years of exposure (i.e., the sum of the adult and child cumulative risk estimates) should be presented.

72. Page 6-15, Section 6.9.1, Paragraph 1 - PREQB considers the evaluation of groundwater classified as a potable groundwater resource in the risk assessment appropriate. The Navy has identified exposure pathway specific risk estimates and has provided a discussion on background concentrations for metals. Therefore, including chemicals detected in groundwater in a risk assessment where groundwater is classified as a potable source is not a source of uncertainty. Not doing so would be a source of uncertainty.

73. Page 6-16, Section 6.10 - As commented earlier, provide a discussion in the text on the soil characteristics of the facility soil samples used to calculate background concentrations as compared to site soils in which metals were detected.

74. Page 6-17, Section 6.10.2 - Remove references to site-wide background concentrations for groundwater from this section. Concentrations of metals detected in on-site wells should be compared to site-specific background monitoring well data.

75. Page 6-19, Section 6.10.2.3, Paragraph 2 - Provide supporting documentation that shows that the ORP and/or pH are reflective of reducing conditions for each groundwater sample where filtered and unfiltered manganese concentrations are similar.

76. Page 6-19, Section 6.10.2.4 - Provide supporting documentation or a reference to a table on the turbidity or total suspended solids of the samples with elevated thallium detections referenced in this section.

77. Figure 6-2 – The locations of the four (4) surface soil samples collected within the building should be indicated and the appropriate arsenic concentrations presented.

78. Page 7-10, Section 7.2.2.1, Paragraph 3 - EPA guidance requires the use of the maximum bioaccumulation values for screening purposes (EPA, 1997). Therefore, 90th percentile BCFs should not be used. The screening should be evaluated to determine if the use of

90th percentile values resulted in the elimination of chemicals from further evaluation that should be included in the risk assessment.

79. Page 7-13, Section 7.2.2.1, Dietary Intakes - Provide a discussion on the assumed dietary composition assumptions (i.e., PDFi) of the dietary intake equation provided in Table 7-8. EPA guidance requires a diet composed of 100% of the most contaminated food item. Therefore, the rationale for varying from the EPA guidance should be discussed in the text of the report.

80. Page 7-13, Section 7.2.3.1, Paragraph 2 - EPA has developed ecological soil screening guidance and levels (Eco SSLs) that should be used to screen soils. The latest publication is a memo from the Office of Solid Waste and Emergency Response dated December 23, 2003 on the "*Release of Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs) and Eco-SSLs for Nine Contaminants.*" This resource should be consulted first, followed by the resources identified in this section. If screening criteria for sediment are not available from these sources, screening criteria should be calculated using the equilibrium partitioning approach or by deriving a NOAEL-based screening criterion from laboratory studies. EPA's Ecotox database should be reviewed to determine if studies are available for chemicals for which NOAELs will be derived.

81. Page 7-14, Section 7.2.3.1, Paragraph 3 - Provide salinity data in this section that shows that the water is saline.

82. Page 7-14, Section 7.2.3.2, Paragraph 2 - Several of the laboratory studies upon which NOAELs were derived are subchronic studies. Since an additional uncertainty factor of 10 should be used to convert subchronic studies to chronic studies, the text and tables of the report should clarify that this was done. If an additional uncertainty factor should be incorporated into the NOAEL, the screening level assessment and the baseline ERA should be evaluated to determine if the application of the uncertainty factor to subchronic studies results in unacceptable risks to the identified assessment endpoints.

83. Page 7-16, Section 7.3.1, Paragraph 2 - Provide a table of the area use factors used in the Step 3A calculations referred to in the last bullet of this paragraph.

84. Page 7-18, Section 7.3.2.3 - As described in the NOAA SQuiRTs, Apparent Effects Thresholds are values above which adverse biological impacts would always be expected due to exposure to that contaminant alone. Adverse impacts are known to occur at levels below the Apparent Effects Threshold. Therefore, these values are not consistent with the screening criteria used for other environmental media or with this phase of the ERA. The EPA Ecotox database should be reviewed to determine if toxicity data is available that can be used to develop NOAEL-based screening criteria. If data does not exist to develop appropriate screening criteria, these chemicals should be retained as PCOCs. Also, Section 7.3.3.3 provides a list of metals retained as PCOCs that Section 7.3.2.3 indicates were not retained as PCOCs, and the list provided in Section 7.3.3.3 does not include the metals identified in Section 7.3.2.3 as being retained as PCOCs (beryllium and thallium). Clarify this apparent discrepancy.

85. Page 7-18, Section 7.3.2.4 - It is not clear from this section that zinc was not retained as a PCOC. It is not until Section 7.3.3.4 that it is made clear that no chemicals associated with upper trophic level receptors were retained. Provide more detail why zinc was not carried forward as a PCOC.

86. Page 7-20, Section 7.3.3.3 - The third sentence states that maximum site concentrations were compared to maximum upgradient sediment concentrations. However the previous sentence references the upgradient sediment sample as the background sample. Clarify in the text what is meant by the maximum background sediment concentration when only one sample was collected upgradient from the site. The last sentence states that barium does not have a literature screening value available and this contributes to the potential for unacceptable risks to be low. Screening values can be derived from studies as described in EPA's guidance *Process for Designing and Conducting Ecological Risk Assessment,* Interim Final. Furthermore, sediment quality criteria can also be calculated from water quality criteria using the equilibrium partitioning approach.

87. Page 7-20, Section 7.3.3.4 - Provide further detail on exceedances of NOAELs. The discussion should include information on the magnitude of the difference between a NOAEL and a LOAEL used for screening and the basis for each LOAEL (i.e., endpoint for the study, such as an LD50).

88. Pages 7-21 to 7-23, Section 7.4 - The uncertainty associated with the lack of screening criteria for sediment and/or water for specific contaminants should be discussed in this section. Each chemical and media should be identified as part of the discussion.

89. Page 7-31, Table 7-6 - Provide a specific reference to Section 7.2.2.1 of the document which discusses the soil-rat BAF.

90. Page 7-60, Table 7-18 - Provide a reference for the allometric equation used to calculate average water and food ingestion rates.

91. Appendix J, Table 4.1 - Clarify why youths are defined as 9 through 18 for the purposes of determining body weight, but are defined as 8 through 18 for the purpose of determine skin surface area. An age group of 8 to 18 (i.e., data for ages 8<9 up to and including 17<18) is preferred.

92. Appendix J, Tables 4.2 and 4.3 - Footnote 3 describes the basis for the body weight for a youth, 51 kg, as the average of the mean values for boys and girls ages 9 through 18. However footnote 4 for Table 4.3 states that the basis for the same body weight (51 kg) is the average value for the 6 year old and 18 year old male body weight. Clarify which approach was used. The age groups represented by the youth receptor should be consistent across exposure pathways.

93. Appendix J, Table 4.3, Footnotes 7 and 8 - These footnotes state that 25% of the total surface area for either a 6 to 18 year old or 0 to 6 year old was used as the skin surface

area exposed to sediments. It is unclear why lower body sizes have been incorporated into the skin surface area for a youth. Lower body size results in lower exposure. It is unclear why a percentage is used when EPA provides specific body part skin surface areas that can be summed to determine an average skin surface area for a particular age group. This approach was used for the adult receptor and should be used for the youth and child receptor as well. The age groups represented by the youth receptor should be consistent across exposure pathways.

94. Appendix J, Table 4.4, Footnotes 6 and 7 - Refer to previous comment on Table 4.3, Footnotes 7 and 8 above. Also, surface water penetrates clothing; therefore, the skin surface area should include arms, hands, legs and feet for the appropriate age groups.

95. Appendix J, Table 4.5 - Due to weather conditions, it is not protective to assume that maintenance workers will be wearing long pants. It is more protective to assume that the legs will be exposed. The skin surface area exposure parameter value should be adjusted accordingly.

96. Appendix J, Table 4.6 - Due to the tropical weather conditions, it is not protective to assume that a maintenance worker would only be on-site for 6 months each year. The exposure duration should be 2 days per week for 52 weeks per year.

97. Appendix J, Table 4.9 - Refer to comment to Page 6-11, Section 6.6.2.9 regarding appropriate construction worker PEF.

REFERENCES

EPA, 1987 *Compendium of Superfund Field Operations Methods*, United States Environmental Protection Agency, EPA/540/P-87/001, 1987.

EPA, 2001 *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites - Peer Review Draft*, United States Environmental Protection Agency, OSWER 9355.4-24, March 2001.

EPA, 2002 *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers – Ground Water Forum Issue Paper*, United States Environmental Protection Agency, EPA 542-S-02-001. May 2002.