N60508.AR.000887
NAS WHITING FIELD
5090.3a

LETTER AND U S EPA REGION IV COMMENTS TO REMEDIAL INVESTIGATION REPORT SITE 11 SOUTHEAST OPEN DISPOSAL AREA NAS WHITING FIELD FL
7/13/1998
U S EPA REGION IV

UNITED STATES ENVIRONMENTAL PROTECTION A
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

03.01.11.0001
ID 00147

July 13, 1998

4WD-FFB

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

SUBJ: RI Report for Site 11

Dear Ms. Martin:

The United States Environmental Protection Agency (EPA) has received and reviewed the Remedial Investigation Report (RI) for Site 11, the Southeast Open Disposal Area (B), at NAS Whiting Field, dated April 1998. Enclosed are EPA's comments based on this review.

If you should have any questions or comments, please feel free to 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 REVIEW COMMENTS
SITE 11, SOUTHEAST OPEN DISPOSAL AREA
REMEDIAL INVESTIGATION REPORT
APRIL 1998

SPECIFIC COMMENTS

1. **Page 3-2, Section 3.2, Second Paragraph**. This section states that a total of 31 soil gas samples were collected, referring the reader to Figure 3-1. However, Figure 3-1 identifies 48 soil gas sample locations. While all soil gas locations may not have provided adequate soil gas results, Figure 3-1 should be modified to distinguish which of the 48 locations correspond to the 31 sample locations referred to in Section 3.2.

2. **Page 3-2, Section 3.2, Third Paragraph**. This paragraph indicates that a "common problem" utilizing the organic vapor analyzer (OVA) was probe flame-out due to high humidity or high CO_2/low oxygen. In this case, a landfill gas analyzer was to be used to measure methane and CO_2 levels. However, Table 5-6 of the Final Draft RI Report provides no results of methane and CO_2 measurements from soil gas locations. Clarification should be provided as to whether the landfill gas analyzer was utilized. If so, the data should be summarized in the report.

3. **Page 3-5, Section 3.3, Second Paragraph**. This paragraph states, "The remaining eight Phase IIB surface soil samples (11S00601 through 11S01301) were collected on a ten-foot-radius around Phase IIA soil sample 11S00401." Apparently, these eight additional samples were to delineate lead contamination. This description is confirmed in Figure 3-2. However, sample 11S00401 is marked as a Phase IIB sample location on Figure 3-2. Additionally, according to Table 5-8 (Page 5-27), sample 11S00401 only contained lead at 40.3 mg/kg, which is comparable to sample 11S00301. It appears, based on the data presented in Table 5-8, that the delineation of lead should have focused on Phase IIA sample 11-SSL-02, which had a lead concentration of 2,230 mg/kg (several orders of magnitude higher than other samples). Section 5.5 also refers to the surface soil delineation around sample 11S00401. This discrepancy should be clarified and modifications to the text and figure made accordingly.

4. **Page 3-5, Section 3.4.1, First Paragraph**. This paragraph states that lithologic data was recorded during monitoring well installation and entered into field logbooks. However, Appendix G includes only lithologic descriptions; no field log notes were provided. It is recommended that either field log notes be included in the report or soil boring/monitoring logs be provided for all soil boring and monitoring well locations.

5. **Page 3-6, Section 3.4.2, Fourth Paragraph**. This paragraph indicates that physical descriptions for the test pits were recorded in field log notes. However, no field log notes

are provided. It is recommended that either field log notes describing the test pit investigation activities be included in the report or test pit logs be provided.

6. **Page 4-7, Table 4-2.** The control limit cited for pyrene is "< 36." This appears to be inaccurate. Control limits are typically cited as a range. This number should be verified.

7. **Page 4-8, Section 4.2.2, First Paragraph**. This paragraph states that since the percent recovery exceeded the target range, "some analytical results may be biased low." However a review of the data tables found in Section 5 does not indicate any "L" qualifiers which are typically used to qualify biased low data. This discrepancy requires correction or clarification.

8. **Page 5-1, Section 5.0.** This section contains subsections describing the geologic and hydrogeologic assessments. However, these sections do not describe the underlying geologic or hydrogeologic zones encountered at the site. This information should be provided to correlate the data collected to specific geologic and hydrogeologic units.

9. **Page 5-1, Section 5.2**. This section describes the direction of groundwater flow based on water level readings found in various monitoring wells at this, and other sites in the area. Table 5-1 summarizes the water level readings, while Figures 5-1 and 5-2 depict the groundwater flow direction for the sand and gravel (shallow) unit. Monitoring well WHF-11-2 is not depicted on either figure, nor is there any figure depicting the flow direction in the deeper hydrogeologic zone below the clay layer. The current figures should be modified to include WHF-11-2 and additional figures depicting groundwater flow in the deeper unit should be developed.

10. **Page 5-1, Section 5.2, Second Paragraph**. This paragraph, which describes the groundwater flow direction in the shallow and deeper hydrogeologic zones, refers to Figure 5-1, which depicts the flow direction. However, according to Figure 5-1, groundwater data from wells WHF-11-1S and WHF-11-1 were not used in the calculations. The legend in Figure 5-1 indicates that WHF-11-1S was not included, presumably as a result of a "perched" groundwater layer. This section should clearly indicate the different hydrogeologic zones and clarify why some wells were not used in these calculations.

11. **Page 5-12, Table 5-2**. The June 1994 average horizontal gradient, based on the six horizontal gradients provided, should be 0.0028, not 0.0029 as cited. The table should be modified accordingly.

12. **Page 5-16, Table 5-2**. The November 1996 horizontal gradient cited for well WHF-11-2 is 0.014. This value appears to be erroneous based on a comparison to other values obtained for that and similar wells. Additionally, this value does not figure into the average hydraulic gradient calculation. This number should be verified, and the table modified accordingly.

13. **Page 5-20, Section 5.4, Second Paragraph**. The first sentence states that 31 of "148" proposed soil gas locations were sampled. However, according to Figure 3-1, this number should be "48". The text should be modified accordingly.

14. **Page 5-35, Table 5-12**. The EPA Region III screening criteria listed for the aroclor compounds is "0.32." This is inaccurate since it is in units of mg/kg. Since all of the results are cited in ug/kg, the corresponding EPA Region III screening value is 320 ug/kg. It is recommended that all screening values be converted to the appropriate units as cited for the soil data. Furthermore, all screening values should be verified to ensure the appropriate conversions are being used.

15. **Page 5-48, Table 5-16**. The values cited for the column "Federal MCLs" is confusing. The column header indicates Federal MCLs, while the footnote to this column (Footnote 5) indicates that the lesser of the EPA Region III risk base concentration (RBCs) for tap water or the Florida Groundwater Guidance Concentration is to be used. It is not clear which is being applied. For instance, the benzene value listed (5 ug/l) is the MCL for that contaminant; however, the EPA Region III RBC for tap water for benzene is 0.36 ug/l, based on the October 1997 RBC tables. In this case, the lower value was not cited. Similar circumstances apply to other chemicals as well. Clarification as to which value is being utilized in this column should be provided in the report.

16. **Page 5-48, Table 5-16**. The value cited for aluminum (200 ug/l) can not be verified. The source of this value should be provided.

17. **Page 8-11, Section 8.2.3, Eighth Paragraph**. This paragraph should discuss the potential, or lack thereof, for groundwater discharge to surface water bodies downgradient of the site

18. **Page 9-3, Section 9.1**. Both the human health and ecological risk assessment (ERA) conclusions should be qualified. It does not appear, based on data presented in the report, that the surficial lead contamination near 11-SL-02 has been fully delineated unless the reference to sample location 11S00401 in Comment No. 6 actually is sample number 11-SL-02). A clarification should be provided.

EPA RISK REVIEW COMMENTS
SITE 11, REMEDIAL INVESTIGATION REPORT
APRIL 1998

GENERAL COMMENTS

19. Chapter seven discusses how risks are calculated for terrestrial wildlife using HQs and HIs. A discussion is provided about how HQs less than one will result in no adverse ecological effects and how HIs greater than one will result in possible adverse ecological effects and warrant further discussion. However, there is no discussion on how an HI or HQ equal to one will be addressed. This scenario should be addressed in the risk characterization section of the text.

20. When sublethal and lethal hazard indices (HIs) were calculated for each receptor using reasonable maximum exposure (RME) point concentrations, the HIs for each receptor were greater than one (except for the cotton mouse). When sublethal HIs were calculated using central tendencies (CTs), the HIs for each receptor were again greater than one (except for the cotton mouse). When sublethal HIs were recalculated excluding sample location 11-SL-02 values, HIs for each receptor were still greater than or equal to one (except for the cotton mouse). HIs for the short-tailed shrew and the eastern meadowlark were both equal to one but were determined to be insignificant because each of the hazard quotient (HQ) values that were summed to calculate the HIs were less than one. The purpose of calculating an HI is to predict the cumulative risks to a receptor from of the combined contaminants. Ruling an HI insignificant because it is composed of HQs that are each less than one defeats the purpose of calculating an HI. Based on the results of this ERA, there is a possibility of adverse effects to reproduction and growth of small mammals and birds inside *and* outside the immediate area of sample area 11-SL-02. The risk to small mammals and birds with HIs greater than or equal to one as well as higher trophic level receptors with HIs greater than or equal to one need further risk evaluation and assessment in the PRG development process.

21. The surface soil assessment description within Section 3 of the RI does not appear to be consistent with the data that are used in the ecological risk assessment. The numbers of samples and the suite of analytes are not consistent between these two sections. For example, Section 3.3, pages 3-2 and 3-5 state that in Phase IIB 5 of the 13 surface soil sample locations were selected for TCL VOCs, SVOCs, pesticides, PCBs, TAL inorganics, and TPH analysis to support the risk assessment; while the remaining eight surface soil samples were only analyzed for lead.

Table 7-2 within the ecological risk assessment indicates that 10 samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL inorganics, while 18 were analyzed for lead. Were five of these samples from Phase IIB and the other five from another phase of the RI? Appendix C presents data from sampling that occurred in August 1992, October 1992, and January 1996. It does not appear that the October 1992 data were used in the ecological risk assessment. Appendix C appears to present surface soil data from 22 sampling locations. All recent validated sampling data should have been used in the ecological risk assessment. The inconsistencies of sample numbers, sample locations, and analysis need to be clarified.

22. Site diagrams presented in the RI Report show a drainage feature labeled "Y" Ditch. The ditch is shown to be hydraulically down gradient from Site 11, but it is not clear if surface drainage flows toward the "Y" Ditch. Sampling of surface water and sediment does not appear to have been collected from the ditch. The lack of surface water and sediment data for the "Y" Ditch is a potential data gap in the characterization of potential contamination at Site 11. Surface flow drainage should be discussed in the text. In addition, the rationale for not collecting sediment and surface water samples should be presented in the text. Additional sampling may be necessary.

23. Discussion in the Human Health Risk Assessment refers consistently to the risk calculations and the exposure variables that are presented in Appendix C. The information is actually presented in Appendix E. All references to Appendix C for exposure parameter and risk calculation data should be changed accordingly.

SPECIFIC COMMENTS

24. **Section 5.5 Page 5-33.** The discussion of the lead concentrations refers to the "USEPA Region III RBC of 400 mg/kg." EPA does not currently have a Region III RBC for lead. The correct source of the screening value should be presented in the text.

25. **Section 6.5.2, Page 6-20**. The text states that inhalation and ingestion of groundwater while showering was evaluated for the future residential scenario. The text does not provide a rationale for not evaluating the dermal exposure pathway for this scenario. An evaluation of the dermal pathway should be presented in the text, or the rationale for not evaluating pathway should be presented. In addition, the exposure parameters used in the calculation presented in Appendix E indicate that the ingestion of tap water was evaluated, not incidental ingestion while showering. The text should be modified

26. **Table 7-1, P. 7-7**. The assessment endpoints for terrestrial plants are stated as a "Reduction in the biomass of terrestrial plants used as forage material," and "Survival and growth of plant communities." One of these endpoints is a positive endpoint (survival of communities) while the other is a negative endpoint (reduction in biomass). These two

endpoints are essentially the same with one being phrased negatively and the other phrased positively. One of these endpoints should be omitted from Table 7-1.

The assessment endpoints for terrestrial invertebrates are stated as a "Reduction in the abundance of earthworms used as forage material," and "Survival and growth of terrestrial invertebrate communities." Again, one of these endpoints is a positive endpoint (survival of communities) while the other is a negative endpoint (reduction in abundance). These endpoints should be combined and both phrased either positively or negatively.

27. **Section 7.3, P. 7-10**. The second paragraph on page 7-10 states that the site-specific background study used to establish background screening values for Site 11 consists of nine surface soil samples (BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501) and one duplicate sample (BKS00201D). However, the analytical data for these background samples is not included with the rest of the soil sample analytical data in Appendix C. These data should be provided.

28. **Section 7.4.2, Terrestrial Wildlife, p. 7-15**. The second bullet at the bottom of page 7-15 provides a discussion of the short-tailed shrew as a wildlife receptor. The home range of the short-tailed shrew is not provided in this discussion although the home ranges for the other ecological receptors are provided in this section. The home range of the short-tailed shrew should be provided in the second bullet.

29. **Table 7-3, p. 7-16**. This table provides the equations used to calculate the potential dietary exposures for wildlife receptors. The variable "TN" is given three different definitions in Table 7-3. They are as follows, 1) the tissue concentration in food item N, 2) the secondary prey item concentration, and 3) the primary prey item concentration. Clarification in Table 7-3 would be beneficial.

30. **Table 7-5, p. 7-18**. 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 whether an average of the exposure parameter is calculated or if a certain study was selected. For example, it is not explained in Table 7-5 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 as high as 63% of the deer mouse's diet but Table 7-5 states that invertebrates make up 10% of the deer mouse's diet. It should be clarified in Table 7-5 how the values in the dietary composition column were derived from the data provided in the handbook.

31. **Section 7.4.2, Terrestrial Wildlife, p. 7-19**. The second paragraph on page 7-19

discusses how the methodologies for the potential dietary exposure (PDE) calculations can be referred to in the General Information Report (GIR) prepared by ABB-ES in 1998. It would be helpful for pertinent excerpts of these methodologies to be provided in an appendix to this report.

32. **Section 7.6.1, Terrestrial Wildlife, p. 7-25**. The first sentence of the last paragraph on page 7-25 states that, "Sublethal risks to small mammals and birds are not predicted based on the revised RMEs for 4,4'-DDD, 4,4'-DDT, dieldrin, and lead." The very next sentence also discusses sublethal risks to small mammals and birds based on the revised RMEs but states that HIs were one. It appears as if the word "sublethal" should be changed to "lethal" in the first sentence.

33. **Section 9. P. 9-3**. When sublethal HIs were recalculated excluding sample location 11-SL-02 values, HIs for receptors, other than the cotton mouse, were one or greater. Therefore, risk to small mammals and birds is possible for the entire area of Site 11 but is greatest at sample location 11-SL-02. The ecological risk conclusion presented in Section 9 should be clarified to express this point.

34. **Appendix C**. Soil sample analytical data for Site 11 is provided in Appendix C. Data for soil samples 11SS0101, 11SS0202, and 11SS0303 are shown in Appendix C but these sample locations are never mentioned in the sampling discussion in Section 7.3 of the text. The purpose and relevance of these sampling locations need to be addressed in the text.

35. **Appendix F**. It is unclear as to why all of the tables in Appendix F are titled using the letter E and not F. Tables in Appendix E and Appendix F are titled using the letter E which can confuse the reader. This discrepancy should be clarified.

36. **Table E-1**. This table presents bioaccumulation factors (BAFs) for terrestrial invertebrates, terrestrial plants, mammals, and birds.

- The terrestrial invertebrate BAFs for PAHs are referenced as the average of values presented in Beyer 1990. It would be preferable to use the individual PAH BAFs presented in Beyer 1990 instead of an average. In cases where an individual value is not presented, then use of an average PAH BAF as a surrogate is appropriate. An average value would be appropriate as a surrogate for bis(2-ethylhexyl)phthalate, 2-methylnaphthalene, and acenaphthylene since values are not provided in Beyer, 1990. The footnote reference should be revised as appropriate.

- The terrestrial plant BAFs for PAHs are derived by using the Travis and Arms equations; however, an average log K_{ow} value is used. The usefulness of averaging log K_{ow} values is questionable. Since K_{ow} values are chemical specific and can

differ among PAH congeners, individual K_{ow} values should be used to derive BAFs.

- A terrestrial plant BAF is not calculated for lead. Footnote "t" states, "lead does not accumulate in plant tissue, therefore, a BAF of zero was assigned." The literature varies regarding lead accumulation in vascular plants. A BAF should be calculated for lead.

- The reviewer could not confirm the mammal BAFs for semivolatiles using the cited Travis and Arms equation for biotransfer factors with conversion to BAFs. The average ingestion rate used for this calculation in the ERA was not provided. Please provide more information on the calculation of the mammal BAFs and re-confirm the calculated mammal BAFs.

- Table E-1 provides a plant BAF of 6.7E-03 for bis(2-ethylhexyl)phthalate. However, when recalculated using the equation in footnote [d], a plant BAF of 8.7E-3 was obtained. Please review this calculation and address this discrepancy.

37. **Table E-2**. Table E-2 presents ingestion toxicity information. The LOAEL column heading should not be under the lethal RTV heading. The LOAEL should be presented with sublethal RTVs. The column headings need to be verified to ensure that they reflect the data in the column and be revised as necessary.

38. **Table E-3**. Table E-3 presents the reference toxicity values (RTVs) selected for the ERA. Table E-2 presents ingestion toxicity data for wildlife. Pyrene has a NOAEL of 75 mg/kg/BW/day, anthracene has a NOAEL of 1000 mg/kg/BW/day, and phenanthrene has a LOAEL of 120 mg/kg/BW/day presented on Table E-2; therefore, it is not clear why Table E-3 presents a surrogate RTV of 10 mg/kg/BW/day for pyrene, anthracene and phenanthrene. The pyrene and anthracene NOAELs and the phenanthrene LOAEL should be used in this assessment instead of using a surrogate.