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NAS PENSACOLA
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January 5, 1996

U.S. Environmental Protection Agency
ATTN: Mr. Jay Bassett
345 Courtland Street, N.E.
Atlanta, GA 30365

RE: Final Remedial Investigation Report Errata,
Site 1, NAS Pensacola
Contract #N62467-89-D-0318

Dear Mr. Bassett:

On behalf of the Navy, EnSafe/Allen & Hoshall is pleased to submit five copies of the Final Remedial Investigation Report Errata and the Response to Comments for Site 1 at the Naval Air Station in Pensacola, Florida.

The enclosed filing instructions should be followed carefully to ensure that your copies contain accurate and up-to-date information. If you should have any questions or need any additional information regarding the errata, please do not hesitate to call me.

Sincerely,

EnSafe/Allen & Hoshall

Henry H. Beiro/ALS

Henry H. Beiro
Task Order Manager

Enclosure

cc: Ron Joyner, NAS Pensacola — 7 copies
John Lindsey, NOAA — 1 copy
John Mitchell, FDEP — 2 copies
Bill Hill, SOUTHNAVFACENGCOM — 2 copies
Tom Moody, FDEP — (w/o enclosure)'
Patricia Kingcade, FDEP — (w/o enclosure)
EnSafe/Allen & Hoshall file — 2 copies'
EnSafe/Allen & Hoshall Pensacola — 1 copy

USEPA TECHNICAL REVIEW COMMENT RESPONSES
DRAFT REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT 1 (SITE 1: SANITARY LANDFILL)
NAVAL AIR STATION (NAS) PENSACOLA
PENSACOLA, FLORIDA

COMMENT:

1. Abstract and Executive Summary:
   A. "..previously installed deep wells, which were not double-cased, should be abandoned to avoid cross-contamination...". The findings of the well inventory survey (particularly recommendations for well plugging and abandonment) should be discussed by the team and acted upon by the Navy in the near future.

   B. The text should be rewritten to resolve conflicting statements regarding the remediation of soil hot-spots identified in the RI (i.e. 7th and final paragraphs). It should also be made clear that the recommendations for remedial action are those of the Navy, not the contractor.

RESPONSE:

A. Agreed. Currently, well abandonment is not budgeted, but is being dealt with by modifying the contract for abandonment in the near future.

B. Agreed. The Executive Summary has been revised accordingly. See pages xv and xvi.

COMMENT:

2. Page 2-10, *Site Reconnaissance Survey*:
"Various discolored water/leachate seeps and areas of soil and/or vegetation staining were located in site wetland areas.". Expand the text to include specific locations. For example, the Contamination Assessment/Remedial Activities Investigation Report for this

site mentioned orange flocculent matter found in the vicinity of at least one nearby wetland (#3?). There was some indication that this flocculent matter might be related to the discharge of iron-rich groundwater.

RESPONSE:

Agreed. The text was revised. See pages 2-10 and 2-loa.

COMMENT:

3. Page 3-9, Section 3.3 (Ecologic Setting):
This section should be revised to include a "site-specific" subsection, similar to that provided in Section 3.2 (Stratigraphy and Hydrogeology). Information on this subject is available from previous E&E documents.

RESPONSE:

The site-specific Habitat and Biota Survey discussion was contained in Section 4.3 which offers a detailed description of the sites ecological setting. See page 4-8.

COMMENT:

4. Page 4-8, Paragraph 3:
Clarify that this investigation included limited sampling of adjacent wetland areas for use in performing a preliminary assessment of the impacts of Site 1 on these water bodies and, identifying affected pathways. This information was to be used to facilitate the selection of more appropriate response actions for Site 1 per se, and to aid the Navy in better focusing future investigations for Sites 41 and 42.

RESPONSE:

The text has been revised as requested by **USEPA. See** pages 4-8 and 4-8a. .

COMMENT:

5. Page 4-12, Section 4.3:
Include a list (table or appendix) of the **area's** threatened and endangered species and species of special concern.

RESPONSE:

Tables 4-1 and 4-2 have been added to the document as requested. **See** pages 4-13 **to** 4-17.

COMMENT:

6. Page 5-2, Paragraph 2:
"Sampling and investigation **procedures** were conducted **in accordance** with the Site **1 SAP,** and the NAS Pensacola **CSAP**...except where site conditions and field decisions warranted changes." Were any of these changes significant? The text should *specify* where in the **report** these changes **are** described.

RESPONSE:

Page 5-2 has been revised accordingly to reference the soil investigation method modification discussed in Section 5.1.1.

COMMENT:

7. Page 5-3, Table 5-1:
This table should reference the source of the methods and include the appropriate document number for the CLP notation in the "Method" column.

RESPONSE:

As agreed during the May/June 1995 Tier 1 Partnering Meeting, future documents will include the referenced information.

COMMENT:

8. Page 5-7, Figure 5-1:
It would be helpful to indicate, through use of a separate symbol, which of these planned borings were not actually installed, due to replacement with an exploratory trench. Currently, there is no one figure in the text which illustrates the location and type of all subsurface soil samples collected at Site 1.

RESPONSE:

All borings shown on Figure 5-1 were installed. Originally proposed soil borings were replaced with trenches at locations 1, 4, 6A, 6B, 6C, 7, 8, and 12 shown on Figure 5-2. Figures 5-1 and 5-2 in combination show all surface and subsurface sample locations. Two separate figures are presented because different investigative approaches were used to obtain samples at these locations - soil borings (Figure 5-1) verses trenching (Figure 5.2).

COMMENT:

9. Page 5-17, Table **5-4:**
Why was a TCWTAL analysis not **performed** on the subsurface contents of Trench 9? According to the text on page **7-65,** waste material was encountered several feet above the water table.

RESPONSE:

Due to the collection of a groundwater sample **from** the bottom of Trench 9, TCLP analysis was **performed** on the waste interval sample instead of TAL/TCL to correlate groundwater contaminant concentrations with the potential leachability of the waste. The results of the sample analyses **are** discussed in Section 7.2 **(see** page **7-32).**

COMMENT:

10. Page **5-35,** Table 5-7:
The preservation requirements for groundwater samples collected for cyanide analysis should specify the use of NaOH to adjust the pH to > 12, not > 10.

RESPONSE:

The text has been revised accordingly. See page 5-35.

COMMENT:

11. Page 7-1, Section 7.0:
A subsection which compares the detection limits achieved with the standards to which the data is compared for each media should be included. This would facilitate evaluation of the effectiveness of the comparison.

RESPONSE:

Detection limit variability is dependent upon technology limitations. Section 9.0 has been revised (see pages 9-26 through 9-28) to discuss conditions affecting detection limit capability, and samples which required detection limit elevation due to unavoidable analytical difficulties. Due to the voluminous amount of analytical data and the frequency at which sample dilution and/or detection limit elevation occurs, a sample by sample parameter by parameter comparison of detection limits and standards would be extremely laborious.

COMMENT:

12. Page 8-2, Section 8.1.1:
Figure 4 4 (page 4-9) of the vegetation communities at Site 1 (originally generated by E&E) shows wetlands located at the southeastern portion of Site 1 and south of Golf Course Pond, but these areas are not shown as wetlands in Figure 8-1A (page 8-3). Include an explanation in the text.

RESPONSE:

As shown on Figure 8-1A, only wetland areas likely affected (i.e., downgradient from detected contaminants) by landfill activities were preliminarily assessed in 1994. All wetland areas including those shown on Figure 4-4 will be mapped and evaluated during the upcoming Site 41 investigation.

COMMENT:

13. Page 8-19, Section 8.3.1:
Include a table showing the field parameter data (i.e. temperature, pH, etc.) for the surface water samples.

RESPONSE:

The primary objective was to evaluate a transport pathway to a human or eco-receptor. The necessity of collecting this data was not communicated to the field crew. However, the primary objective was met, focusing on a contaminant found in that pathway. Future sampling will include collection of this data.

COMMENT:

14. Page 8-22, Table 8-7:

A. The concentration units for the inorganics in surface water samples should be ppb (ug/L).

B. The freshwater Ambient Water Quality Criterion (chronic) for aluminum is 87 ug/L; add it to the table.

C. For chromium, include the AWQC for both trivalent and hexavalent chromium. Also, include the saltwater criteria for chromium.

D. Include the freshwater criterion of 1000 ug/L for iron.

E. Include the EPA Region IV Waste Division freshwater screening values for 1,4-dichlorobenzene, benzene, and chlorobenzene.

F. Indicate whether the freshwater criteria were adjusted for site-specific hardness, where appropriate, and include the site-specific hardness in a footnote.

G. The Florida Surface Water Quality Standards should also be included in the table, since they are probably ARARs for this site.

RESPONSE:

A. Table 8-7 has been corrected and revised (page 8-22).

B. Table 8-7 has been corrected and revised (page 8-22).

C. Table 8-7 has been corrected and revised (page 8-22).

D. Table 8-7 has been corrected and revised (page 8-22).

E. Table 8-7 has been corrected and revised (page 8-22).

F. Hardness values were not collected. A hardness value of 50 mg/l was assumed based on sampling from previous sites at NAS (see response for comment 13).

G. The Florida Surface Water Quality Standards have been added to Table 8-7.

COMMENT:

15. Pages 8-19 through 8-28, Section 8.3.1:

A. Modify the discussion of surface water and sediment results as needed, based upon the comments given above on the data summary tables.

B. The potential effects of future ground water discharge to surface water must also be addressed. EPA has previously recommended that this be done by comparing ground water chemical concentrations to surface water standards, as a worst-case scenario for ground water potentially discharging into a surface water body. Since the upper ground water zones apparently discharge into Bayou Grande as well as the nearby wetlands and smaller water bodies, all of these areas must be considered with respect to potential effects of ground water contaminant discharge.

RESPONSE:

A. The Section 8.3.1 text has been revised accordingly based on additional surface water criteria. See pages 8-22 to 8-28a.

B. The results of shallow groundwater samples collected in 1994 from locations within 300 feet of surface water bodies have been compared to USEPA Region IV freshwater surface water screening values. Pages 8-48 and 8-54 have been revised to include a discussion of this comparison.

COMMENT:

16. Page **8-54,** Section **8.3.2.2:**
According to the text, twelve intermediate wells were analyzed **for** the **full TAL/TCL** in **1994.** Yet the ensuing text includes no discussion for chromium **or** lead - **two** metals for which significant exceedences of regulatory **standards** were noted in **1993** intermediate zone samples. Significant **MCL** exceedences **for** chromium were **also** detected in shallow wells in **1994.** Please clarify whether **1994** samples collected for intermediate groundwater were analyzed **for** these metals.

RESPONSE:

The **1994** intermediate well groundwater samples were analyzed for chromium and lead; however, these parameters were not detected above instrument detection limits which were well below primary **drinking** water **standards for these** two parameters.

COMMENT:

17. Page **9-8,** Section **9.3:**
As mentioned above, the Site **38 RI Report** must address the potential for ground water contaminants to discharge into surface water at concentrations of ecological concern.

RESPONSE:

This comment refers to the Site **38** RI **Report. See** the **response** to comment 15 in **regard** to **Site 1.**

COMMENT:

18. Page 10-16, Paragraph 1:
It is stated that industrial screening values are used for combined surface and subsurface soil samples. For screening purposes Region IV promulgates the use of residential soil values only. Therefore, these screening values should be changed in the accompanying tables. The rationale given for use of industrial screening values is well taken, however, it is also understood that in construction of many residential neighborhoods subsurface soils become surface soils after construction and vice-versa.

RESPONSE:

Agreed, residential screening values were used in the revised document.

COMMENT:

19. Page 10-17, Paragraph 2:
As stated previously, documents should not reference EPA personnel - or Region IV -by name. References should be to written documents only (e.g. guidance, policy, statutes). Please make the necessary changes both here and throughout the document.

RESPONSE:

This comment has been incorporated into the revised BRA.

COMMENT:

20. Page 10-23, Paragraph 3:
The first sentence states incorrectly that the twice background rule *can* be used to screen organic chemicals. The twice background rule only applies *to inorganic* chemicals and may not be used to screen organics, as it is assumed that most organic chemicals found at hazardous waste sites are produced through human activities. The second sentence

states "...it is assumed that organic chemicals *are* not present in reference samples", which is true, but if they are, they *can* not be used for screening purposes as this sentence implies. Please make the appropriate corrections to the text.

RESPONSE:

This section of the BRA has been revised to reflect that reference concentrations *are* calculated only for inorganic parameters.

COMMENT:

21. Pages **10-25** through **10-38,** Tables **10-7** through 10-9:

A. A column should be added to these tables to show the average concentration of each chemical.

B. Please recheck all screening values in *these* tables. Some of the screening values listed *are* incorrect. For example, manganese should be 39, not **1092 mg/kg,** and this change results in the inclusion of manganese as a COPC.

C. As stated above, the residential screening values should be **used** in Table **8.**

RESPONSE:

These comments have been incorporated into the revised **BRA.** The screening value for manganese mentioned in comment **21-B** was calculated based on the RfD for food. Although the food-based RfD is more appropriate for the ingestion of soil pathway, 39 mg/kg was used as a screening value as requested.

COMMENT:

22. Page **10-62,** Section **10.1.3.5:**
The toxicity equivalency factor for Chrysene is 0.001.

RESPONSE:

Agreed. This correction has been made.

COMMENT:

23. Page **10-66,** Footnote **"F".:**
The skin surface area should reflect inclusion of the exposed head along with the exposed forearms and hands. This will result in a skin surface area of 4100 cm^2 (as derived from the 95th percentile values from Table **8-3, USEPA,** 1992*). Finally, as commented previously, it is inappropriate to list EPA personnel as references.

RESPONSE:

This comment has been incorporated into the revised **BRA.**

COMMENT:

24. Page **10-69,** Figure **10-1:**
It should be made clear in this figure that the equations are being multiplied by either the ingestion factor or the cancer factor, but not both.

RESPONSE:

This comment has been incorporated into the revised **BRA.**

COMMENT:

25. Pages 10-83 through 10-84, Table 10-25:
This table should include modifying factors where appropriate and a column for listing critical effects of each chemical. The oral uncertainty factors for chromium and trichloroethene are 500 and 3000 respectively.

RESPONSE:

This comment has been incorporated into the revised BRA.

COMMENT:

26. Pages 10-99 through 10-106, Tables 10-26 through 10-32:
The CDIs for each of these chemicals should be included in these tables to facilitate the reader's calculation of the hazard quotients and cancer risks.

RESPONSE:

USEPA previously requested that CDI information be removed from tables in the BRA risk characterization section; therefore, they are not included.

COMMENT:

27. Pages 10-135 through 10-157, Section 10.6:
The Risk Uncertainty section should be used to comment on the uncertainties introduced in the final assessment of risk. There are many points in this section where this is not accomplished. This section should not be used as a "general comments" section but should stick to the point: what are the introduced uncertainties and do they tend to overestimate or underestimate the risk or hazard involved? To illustrate this point, on

pages 10-112 through 10-113, the second two paragraphs have nothing to do with uncertainty in the risk assessment, and unless their purpose is made clear in this regard, they should be removed from the document altogether. (Also, as commented previously, it is inappropriate to list EPA personnel as references.) The last paragraph is simply unclear. For example it is stated that "...some uncertainty exists in the sum effect of exposures to numerous constituents near the screening values,". It must be stated how an uncertainty affects the risk assessment. It is not good enough simply to state that "an uncertainty exists". This section requires a thorough rewriting.

RESPONSE:

The uncertainty section was rewritten, and the variability and likelihood of over- or under-estimation of exposure was included as appropriate.

COMMENT:'

28. Page **10-132,** Section **10.2:**
Include a conceptual site model, showing the affected media, contaminant migration pathways, and exposure pathways for ecological receptors (terrestrial and aquatic/wetland plants and animals).

RESPONSE:

Agreed. This has been included in the revised BRA.

COMMENT:

29. Page 10-134, Section 10.2.2:
A. Table 10-1 does not show a comparison of mean and maximum concentrations to ARARs. It looks like this should be Table 10-7.

B. Include a table similar to Table 10-7, replacing the human health screening values with ecological screening values, where available. The ecological Chemicals of Potential Concern will not necessarily be the same as those far human health. (Note: The Florida surface water quality standards and possible the AWQC would be ARARs for surface water, but the sediment screening values would not be ARARs.) Also, see the comment given above concerning the evaluation of potential effects of ground water contaminant discharge.

C. Section 4.3, pages 4-10 to 4-11, says that the mixed hardwood/pine forest (Figure 4-4) "provides suitable gopher tortoise habitat." The gopher.tortoise is a state species of concern that digs burrows. Therefore, even though the terrestrial risk assessment should focus on the 0-1 ft. surface soil interval, subsurface soil contamination should be addressed with respect to potential risk to burrowers such as the gopher tortoise.

RESPONSE:

A. Specific ARARs for soil parameters with regard to ecological impact do not exist. However, ecological impact by soil contamination is evaluated through uptake bioaccumulation models as discussed in the ecological risk assessment.

B. For the BRA only surface soil concentrations have been considered for the quantitative risk assessment, these are included in a table for Ecological Chemicals of Potential Concern (ECPCs). Sediment concentrations in the two pond areas of Site 13 have been evaluated qualitatively to SSVs and are discussed accordingly. Surface water samples were only collected from the drainage ditch and now this area is not being considered for this report. It will be addressed under the Florida UST program.

C. No gopher tortoises or burrows have been identified at the Site therefore no consideration of concentrations below 1 foot bls is addressed in this BRA. Bio uptake from food chain transfer is a much more significant exposure pathway than dermal exposure and this has been addressed by the model.

COMMENT:

30. Page 10-139, General Comments:

A. In following the "Framework" document (mentioned in Section 10.2, page 10-132), the Exposure Assessment (here called "Exposure and Pathways") should be followed by the Ecological Effects Assessment, which in turn is followed by the Risk Characterization. As recommended for previous ecological risk assessments for NAS Pensacola, this standard outline should be used in presenting the steps of the risk assessment. For example, the Ecological Effects Assessment should include the toxic effects information from the current Risk Characterization subsection called "Predicted Effects."

B. Since risks are evaluated for both soil and ground water contaminants, it would be helpful to divide the Risk Characterization section into those two subheadings.

RESPONSE:

A. The Ecological Risk Assessment format has been revised and now includes sections discussed in this comment.

B. The Ecological Risk Assessment format has been revised and now includes sections discussed in this comment.

COMMENT:

31. Page 10-139, Section 10.2.4:
Also mention that food chain exposure will be evaluated (e.g. for pesticides).

RESPONSE:

A food chain exposure scenario is included in the risk assessment.

COMMENT:

32. Page **10-140,** Paragraph **2:**
Explain what is meant by "measured field sampling variability" (i.e., natural variability?).

RESPONSE:

This term has been eliminated.

COMMENT:

33. Page **10-140,** Paragraph **3:**

A. **Explain** what is meant by "risk...due to infrequency of detection and low concentrations" (i.e. **risk** is low?).

B. **Explain** what is considered to be the "level of **significant** effect" for **total** PAHs (i.e. based on the earthworm toxicity **data** presented in the preceding paragraph?).

RESPONSE:

A. This statement was to infer a qualitative evaluation based on spatially **reduced risk** factors. If maximum contaminant concentrations **are** high but only found in a very small area, then overall **risk** to mobile receptors **at** the site **will** be **reduced** accordingly.

B. Based on literature reviewed toxicity information, lowest concentration levels were identified which indicated that potentially **a** significant physiological effect would occur. These concentrations were compared to concentrations observed at Site **1** to assess **"if" an** effect could potentially occur. This was the intent of the statement "level of significant effect".

COMMENT:

34. Page 10-141:

A. While the toxicity information presented is good, it is rather limited. Another good source of toxicity information is the USFWS series of Contaminant Hazard Reviews by Ronald Eisler. (More information about these publications can be provided upon request.) Some information is also available in the IRIS database.

B. Expand the discussion of risk related to food chain exposure to pesticides and PCBs, in view of the potential for biomagnification. Food chain exposure (for pesticides/PCBs as well as other COPCs) should be modeled for representative species for this site. Include a table comparing the calculated exposure doses (based upon mean and maximum chemical concentrations) to reference toxicity values obtained from the literature. Hazard Quotients and Hazard Indices should then be calculated. Some of the COPCs (such as pesticides) found at elevated concentrations appear to be localized, while others are more widespread but at lower concentrations. This information should be included in the evaluation.

C. In paragraph 1, explain whether the poisoning of robins at 60 ppm DDTR represents lethality and whether the effects of blackbirds and thrushes are lethal or sublethal.

D. Also include information on the effects of metals (e.g. copper, zinc) on vegetation.

RESPONSE:

A. All Eisler documents have been reviewed for those chemicals or compounds published. Most of the Eisler information is related to aquatic toxicity. All readily available current soil toxicity information applicable to this assessment has been reviewed.

B. A food chain exposure model for two wildlife species has been determined. Maximum values have been used for both lethal and sublethal exposure scenarios. HQs and HIs are determined for the species selected.

C. The discussion of robins represents lethality levels, the discussion of blackbirds and thrushes did not specify the endpoint.

D. Information on metal effects to vegetation is included and transfer through plant receptors has been addressed in the food chain model.

COMMENT:

35. Page **10-143,** Potential *for Species/Community Effects*:
This section should be modified as needed, based upon the comments given above. It should also mention the suitability of onsite habitats for species of special concern. (See Section 4.3.)

RESPONSE:

This section has been deleted from the current **BRA.**

COMMENT:

36. Page **10-143,** Section **10.2.3,** Ground Water **Risks:**

A. Include an evaluation of **risk** related to **potential** discharge of ground water contaminants to Bayou Grande.

B. The purpose of this **initial** evaluation of wetland surface water and sediment contaminant concentrations was not to determine **risk** but rather to **check** for indications of possible past contaminant migration from Site **1** to those **areas.** Therefore, the discussion of **risk** here is not appropriate. **Exceedances** of screening values here may indicate a need for further evaluation of the wetlands.

C. In discussing the surface water and sediment **data** for the wetlands/ponds, also mention any correlation with the types of chemicals and their concentrations found in soil and ground water upgradient from these wetlands. **This** would help in evaluating migration.

RESPONSE:

A. A preliminary comparison of shallow groundwater quality to surface water screening values has been added to Section 8.0 **(see** pages **8-48** and **8-54).** A comprehensive evaluation of potential impact to surface water bodies will be performed during the Site 40/42 RI.

B. Section 8 discusses the contribution potential to wetlands from Site 1. Further evaluation is planned during the Site 41 RI.

C. Again, this has been done to some extent in Section 8 of this document.

COMMENT:

37. Page 10-144, Section 10.2.3:
In paragraph 2, the suggestion that "contaminants are immobilized in sediments with limited toxic effects" is unsupported and should be changed, with respect to toxic effects.

RESPONSE:

Actual effects from sediment contamination in wetlands will be assessed in the Site 41 RI.

COMMENT:

38. Page 10-144, Section 10.2.5:
This section should be modified once the comments given above are addressed.

RESPONSE:

Agreed. This section has been modified.

COMMENT:

39. Page 13-3, Paragraph 1:
"No additional deep well installation is recommended for assessment purposes." The location of the three existing deep wells are inadequate for purposes of confirming the vertical extent of groundwater contamination at Site 1. At least two additional deep wells, adjacent to locations on the east and west sides of the landfill which exhibit the highest contaminant concentrations in the shallow and deep zones, must be installed during the FS or RD stage. The potential for downward contaminant migration clearly exists, given the strong downward hydraulic gradient observed between the shallow and intermediate zones (page 11-6). Yet given the southward (or possibly eastward) direction of groundwater flow in the deep zone, two of the three existing deep wells are actually upgradient of the areas of greatest surficial groundwater contamination, and none is located proximate to these areas. Finally, E&E detected low levels of mostly VOC and BNA TICs in deep groundwater samples in 1991. Although their data is admittedly suspect, more conclusive confirmation of the vertical extent of groundwater contamination at Site 1 is needed.

RESPONSE:

As agreed during the May/June 1995 Tier 1 Partnering Meeting, potential deep zone contamination (or lack thereof) will be confirmed during RD/RA by strategically installing wells in surficial zone source and/or downgradient locations.