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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, S.W.
ATLANTA, GEORGIA 30303-3104

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June 10,1998

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Commanding Officer,
Southern Division, NAVFACENGCOM
Attn: Mr. Bill Hill (code 1851)
P.O. Box 190010
North Charleston, South Carolina 29419-9010

SUBJ: Draft Record Investigation
Operable Unit 15, Site 40
Naval Air Station Pensacola
EPA Site ID No.: FL9170024567

Dear Mr. Hill:

The U. S. Environmental Protection Agency (EPA), has completed its review of the above subject document. Comments are enclosed.

If you have any questions please contact me at (404) 562-8538.

Sincerely,

Gena D. Townsend

Senior Project Manager
Federal Facilities Branch

cc: Ron Joyner, NAS Pensacola
Brian Caldwell, Ensafe
Allison Dennon, Ensafe, Memphis
John Mitchell, FDEP

1.0 GENERAL COMMENTS

1. Section 3.3, Page 3-6, Paragraph 0 states that protected enbayments of the bayou contain a relatively diverse group of species. However, the text does not include a discussion of the location of these protected enbayments since species diversity may be very different between the protected enbayments and the narrow sandy strands. Such a discussion should be included.

2. Section 4.0, Pages 4-1 through 4-10 discuss the preliminary survey. The text indicates that for ease of assessment and discussion, sections of Bayou Grande shoreline were separated into four assessment zones (AZs) based on the known site influence and sediment type. However, according to the results presentation (most tables and figures in Section 7), there is no discussion on the results from each zone. Therefore, the significance of the four zone division is unclear since all the results are combined. The text should address the significance of the zone division related to the results.

3. Section 7.0, Page 7-1, Paragraph 1 presents the Nature and Extent of Contamination. The text indicates that Phase II sampling approach was based on results of Phase 1 sampling. Phase II used modified CLP methods. However, this document does not show any significant differences between Phase II and Phase 111 except different sampling periods. If there are no significant differences between Phases II and III, the analytical results of the two phases should be combined instead of separated. This issue should be clarified accordingly.

4. Section 7.0, Page 7-1, Paragraph 2 presents the Nature and Extent of Contamination and this paragraph describes the figures in the report. It appears from the figures that all results including the rejected nondetects are included in these figures. The figures should be revised such that the rejected nondetects are not included in the presentation of the data. In this way, the coverage of the analyses can be assessed. In addition, the figures should display the boundaries of the Assessment areas.

5. Section 7.1, Page 7-1, Paragraph 3 presents the Nature and Extent of Contamination of the metals and this paragraph describes the summary table for the metals. However, the summary data is not subdivided into assessment areas. This table and the tables presenting the organic results should be subdivided into assessment areas so that the pattern of contamination can be assessed.

6. Section 9.0, Page 9-1 presents a very brief discussion of the fate and transport of contaminants into and within Site 40. This discussion does not address the specific properties of the individual contaminants, does not discuss the biotransformation and

bioaccumulation of the contaminants and does not discuss the sediment migration pathways. The above information is important since the major exposure pathways for both human and ecological concerns are via contaminated biota which is the only exposure pathway for humans. Therefore, it is imperative that the pathways of contaminant transport be clearly stated in this report. This section should be re-written accordingly.

7. Section 9.2, Page 9-1 presents a general discussion on contaminant migration. However, biotransformation and bioaccumulation are not discussed. In particular, the biotransformation of inorganic mercury into methyl mercury is an important factor of fate and transport of mercury compounds in the coastal marine environment. Discussions on biotransformation and bioaccumulation of mercury should be added to this section.

8. Section 9.2.2, Page 9-7, Paragraph 1, Sentence Bullet 4 discusses the migration pathways for the Site 40 contaminants and this bullet briefly presents the concept of sediment movement. However, the magnitude of sediment movement and direction of sediment movement is not presented. This section should be expanded to include a discussion of the transport of contaminants to Site 40 and the movement of sediment within Site 40. This discussion should be presented based on assessment area since the sediment transport is likely to be different within each assessment area.

9. Section 10.2.1.2, Page 10-29, Paragraph 3 indicates that sample location AZ3-24 (stormwater discharge point off the Navy Boulevard Bridge) had the most significant tPAH and individual compound PAH contamination. The text should include a discussion of the potential impacts associated with the golf course outfall via Wetland 4.

10. Section 10.2.1.2, Page 10-31, Paragraph 1 states that pesticides appear to be ubiquitous within the bayou and concentrations of DDD, DDT, and total PCBs could affect sensitive benthic fauna or be biotransferred to upper-level vertebrates. However, the text should state that DDD, DDT, and total PCBs should be examined as part of a more focused ecological risk assessment.

11. Section 10.2.1.2, Page 10-32, Paragraph 2 states that concentrations of PAHs *suggest* a moderate risk to ecological receptors in these areas. However, it is unclear how it was determined that risk from PAHs provided a "moderate risk" especially since HQs for individual PAHs ranged from 236 to 1490, and tPAh had HQs up to 163.8. Therefore, the text should state that due to the elevated concentration of PAHs in sediments, risk to ecological receptors is predicted. Additionally, the range of HQs calculated for PAHs should be added to the text.

12. Table 10-4, Page 10-36 lists the assessment endpoints selected for Site 40. However, the benthic macroinvertebrate community assessment endpoint is too vague and it is unclear what part of the benthic community is to be "protected". The Region 4 (1995) and the EPA Process Document (1997) state that the definition of an assessment endpoint "is the explicit expression of an environmental value that is to be protected." Based on this definition, this assessment endpoint fails to provide an explicit expression of an environmental value that is to be protected. Therefore, this assessment endpoint should be rewritten to be more specific in stating what about the benthic macroinvertebrate community is to be protected (for example, protection may mean the maintenance of a diverse and abundant benthic community). *Also,* an additional column should be added to this table stating which species was used to represent each appropriate assessment endpoint. For example, the great blue heron was selected to represent fish eating birds.

13. Section 10.2.2.1, Page 10-38, Paragraph 2 states that locations for Phase III sampling were selected based on relatively high, medium, and low bulk sediment contamination concentrations observed from the Phase II data. However, no information which allows for a correlation of Phase II sampling locations to Phase III sampling locations is provided. Without this information, it is difficult to determine how Phase III data corresponds to Phase II data. Thus, the interpretation of Phase III data is limited. The text should state what sample locations from Phase II correlate with sample stations in Phase III.

14. Section 10.2.2.1, Page 10-39, Paragraph 0, Sentence 4 states that forage fish were sampled and analyzed of tissue content of PCBs from Station 40-06. However, it appears from data in Table 10-12 that only two fish were sampled. To clarify the fish sampling issue, the following items need to be discussed: the number of fish sampled, if replicate samples were used, fish species sampled, and weight of fish sampled.

15. Figure 10-2, Page 10-40 depicts the hazard indices produced for contaminant concentrations at Phase III stations. However, a legend should be added to this figure showing Phase III sampling stations compared to their corresponding Phase II sampling locations.

16. Section 10.2.2.1, Page 10-41, Paragraph 3 references Table 10-7 (page 10-44). However, the text does not contain a discussion of the results of the Shannon-Weiner diversity, Pielow's Eveness, or MacArthur's Equitability tests. Based on the results shown in Table 10-7, stations 40-04, 40-09, and 40-10 appear to have different tests results than other sample stations. The text should include a more expanded discussion of the results of the tests presented in Table 10-7. Additionally, a new *figure* should be added to the text depicting the results of the Shannon-Weiner diversity, Pielow's Eveness, Margaiefs Richness, and

MacArthur's Equitability tests compared to HIs in one figure. This new figure would allow for a more complete comparison of the tabular results presented in Table 10-7.

17. Section 10.2.2.1, Page 10-41, Paragraph3 states that no benthic sample was taken at Station 8. However, there is no explanation why benthic samples were not taken from Station 8. The explanation should be added.

18. Section 10.2.2.1 , Page 10-46 references the data presented in Table 10-9 as the source of variables used to calculate HQs due to exposure to concentrations of tDDT and tPCBs fiom fish tissue. The text should reference where the original data set for the fish tissue concentrations are located.

19. Section 10.2.2.1, Page 10-46, Paragraph 1 states that no impacts to fish communities are expected from water-borne contamination at Site 40. However, the text does not discuss potential impacts to fish fiom concentrations of contaminants present in sediments. The text should be revised to discuss sediment concentrations of contaminants on fish.

20. Section 10.2.21, Page 10-46, Paragraph 2 discusses the potential impacts to piscivorous birds, such as the great blue heron, fiom oral ingestion of tDDT and tPCBs in fish tissue. However, it appears from the text that only one individual killifish and pinfish were sampled. It is unclear how any statements could be generated on impacts of contaminants fiom tissue of only two individual fish. In addition, it is unclear if killifish and/or pinfish would be considered prey by a great blue heron. The text should be revised to 1) discuss the limitations inherent with only using two fish samples, and 2) address the issue of whether killifish/pinfish are considered to be food prey species for the great blue heron.

21. Section 10.2.2.1, Page 10-46, Paragraph 2 discusses the potential impacts to piscivorous birds, such as the great blue heron, fiom oral ingestion of tDDT and tPCBs in fish tissue, sediment, and water which were below 1. However, data fiom Table 10-9 shows that no tDDT was detected at sample 40-06 and this non-detect results in a lower calculated impacts from tDDT. Results from Phase 11 sampling indicated that maximum concentrations were 16.0 ug/kg (DDD), 13.0 ug/kg (DDE), and 22 ug/kg (DDT). Therefore, it is unclear how station 40-06 is supposed to represent the high bulk sediment contamination concentrations based on the results from the Phase II data. The text should include a discussion on the lack of correlation for sediment tDDT concentrations between Phase II and Phase III sampling-sites.

22. Section 10.2.2.1, Page 10-50, Paragraph 2 states that tissue concentrations from fish were not at concentrations which pose a risk to fish eating birds. However, since it appears that only two individual fish were sampled, this statement cannot be verified. The text should be revised to state that only two individual fish were sampled so risk to fish eating birds may be over or underestimated based on the limited fish samples.

23. Table 10-10 Page 10-51 presents a list of the uncertainties associated with the ecological risk assessment at Site 40, Bayou Grande. However, the list should be expanded to include, at minimum, the uncertainty associated with the following:

a. Fish sampling consisting of two individual fish
b. Lack of correlation between Phase II and Phase III, especially with regards to tDDT sediment concentrations

24. Section 10.3 presents the human health risk evaluation. The sediment samples from the entire OU are summed together even when there are obvious differences between assessment areas. This risk evaluation should be subdivided according to assessment areas such that a risk management decision could be made on each assessment area.

25. Section 10.3.1, Page 10-52 describes the exposure scenarios for the human receptors. This section states that since the sediment samples were collected at depths where the sediment is always beneath the water, there is no direct human exposure to the sediment. Apparently, there were no samples collected at the shoreline (at the tidal interface) where there is potential human exposure. It is not known if the shoreline contamination is being addressed in another OU report. However, the shoreline sediment contamination is a potential exposure pathway for human receptors and is also a very important exposure pathway for ecological receptors. If the shoreline sediment contamination is not being addressed in

another OU report, it should be addressed in this report.

26. Section 10.3.1, Page 10-52, Paragraph 5, Sentence 2 presents the human receptor exposure scenarios. This sentence states that since surface water exposure is very dynamic, surface water exposure does not constitute a significant route of exposure. The first paragraph on this page also stated that surface sampling is a snapshot in time and would only validate surface water quality. However, just because concentrations can change rapidly over time does not mean that the exposure pathway is not significant, and the dismissal of surface water sampling and exposure in this manner is not appropriate. This issue of surface water sampling over time can be addressed by sampling over time to obtain multiple snapshots so that an overall view of surface water contamination can be assessed. This also would address the issue of dynamic exposure. If the areas are used for recreational purposes, then surface water exposure to organics can be significant. A point was made in Section 3 that the Bayou Grande waters are relatively less dynamic because of the partially confined nature of the bay. Therefore, it is suggested that surface water sampling be performed at the areas where there are discharge points into the Bayou Grande. It is also suggested that this sampling be performed for at least four events.

27. Section 10.3.3 is the uncertainty section which discussed the uncertainty relating to the fish analyses and the TBP model. However, the uncertainty relating to the sampling and the completeness of the analytical methods is not discussed. This discussion should be added.

28. Section 11.0, Page 11-1, Paragraph 3 states that no risk to ecological receptors is present from contaminants at Site 40. However, based on the inability to correlate Phase II and Phase III data and the lack of adequate fish data, this statement is not valid at this time. The conclusions concerning ecological risk should only be made after the issues raised during the review are appropriately addressed.

29. Section 11, Page 11-2, Paragraph 4 presents conclusions and recommendations for Site 40 and recommends no further action. However, the data presented in this report is inadequate to support this recommendation. The presence and/or extent of methyl mercury contatnination was not addressed and the small fish were not analyzed for mercury or methyl mercury. The data does suggest that there is an accumulation of pesticides and PCBs in fish and that the source of these contaminants may be the sediments. The TBP model and the small fish data indicate that there is a potential for human health concern by predicting risks in the range of 5×10^{-5} to 5×10^{-4}. There was no effort made to address the potential uptake of contaminants by shellfish which may be greater than for game fish. There was a constant reference that the risk estimates were related to subsistence fishing whereas the RBC does not relate to subsistence fishing. The model inputs are not sufficiently conservative to state that there is no risk concern. Finally, there is no relationship or relevance between the TSCA criteria for soils and marine sediments. The recommendations should be that additional biota

sampling is necessary and the areas where mercury contamination was observed should be sampled for methyl mercury.

2.0 SPECIFIC COMMENTS

1. Section 5.0, Page 5-1, Paragraph 2, Sentence 2.

This section presents the field investigation methods for the report and this paragraph presents the analytical methods. This sentence states that all Phase II and Phase III samples were analyzed for the full TCL/TAL list. However, there is no mention of analyzing samples for methyl mercury. Mercury contamination has been a concern for a number of years. Since it is quite possible some of the inorganic mercury has been transformed to methyl mercury in the coastal sediments, the presence or absence of methyl mercury should be confirmed. There should be a re-sampling for methyl mercury.

2. Section 5.0, Page 5-1, Paragraph 2.

This section presents the field investigation methods for the report and this paragraph presents the analytical methods. However, it was noted in the data validation section (Section 8) that some of the sediment samples were digested for metals analysis using a specialized technique with hydrofluoric acid. This method of digestion is not discussed here and the purpose of the specialized digestion is not presented. The rationale for this digestion should be presented.

3. Table 7-1, Page 7-2, Column: Frequency of Detection.

This table presents the data summary for all inorganic sediment data. However, the frequency of detection ratio does not reflect the number of rejected samples. It is customary to decrement the number of samples by the number of rejected samples. This includes the analytes for which the nondetects were rejected. For example, it was noted that there were antimony nondetects which were rejected. This table should be corrected.

This comment applies to all the screening tables.

4. Section 7.1, Page 7-4, Paragraph 0, Sentence 0.

This section is a discussion of the inorganic analytical results and this sentence states that the table contains the arithmetic mean of the detected concentrations. However, averaging only the detected concentrations does not have a statistical basis and is a biased average. The bias is towards a higher average. The more appropriate statistic is to compute the arithmetic

mean of all the results substituting one half of the sample quantitation limit (SQL) for the non-detected results. This table should be corrected as well as other summary tables.

5. **Section 7.1. Page 7-4, Paragraph 1. Sentence 4.**

This section is a discussion of the inorganic results and this sentence states that the detected concentrations are compared to risk-based screening concentrations. However, it is not stated that the screening concentrations are only ecological screening concentrations. In addition, it should be noted that the ecological screening concentrations from MacDonald are not entirely based on risk values. The text should be revised to reflect the above points.

6. **Figures 7-1 through 7-54.**

Section 7 presents a great number of figures. However, some of these figures *can* be combined or regrouped based on the chemical properties and similar structural properties of the analytes. For example, for the contaminants of the PAH group (see Figures 7-22 through 7-28), one figure can be used to present PAH contamination. In addition, in order to distinguish "detected" and "nondetected" it is suggested that a dark diamond be used for "detected" and a circle for "nondetected" for all the figures.

The figures should also include sample identifications and detected concentrations above screening values. The information will be helpful in showing areas that are only slightly above the screening criteria verses significantly above the screening criteria..

7. **Section 8.13. Page 8-6, Paragraph 2. Sentence 1.**

This section is a discussion of the results of the data validation review of the calibration data. This sentence indicates that several compounds with percent differences outside continuing calibration QC criteria. However, it does not state which compounds, how many times there were deficiencies, and which samples were affected. This information should be added to the report.

8. **Section 8.1.4. Page 8-8, Paragraph 1.**

This section is a discussion of the blank contamination and this paragraph discusses the common laboratory blank contaminants. However, there is not a *summary* table of the blank contamination and the samples affected by blank contamination. This table should be added:

This comment also applies to the *same* issue in Section 8.2.4 *(page* 8-17, paragraph 1).

9. Section 8.2.7, Page 8-19. Paragraph in text table.

This section is a discussion of the matrix spikes and duplicates for the metal analyses. This table displays the QC exceedances and the samples affected. It is apparent that many of the antimony results are rejected. However, there is no discussion regarding the antimony rejection. These laboratory discrepancies should be discussed further and a summation of how many antimony results that are rejected should be included. In addition, this is a point for the uncertainty discussion.

10. Section 8.3.1, Page 8-21, Parayraph 1.

This section presents a data completeness summary and this paragraph states that there was a 98% completeness of all data. In addition, it states that no positive results were rejected. However, the presentation of percentage of completeness in this manner does not describe the complete picture. The percentage of completeness should be based on individual analytes or analytical fractions (VOCs, SVOCs, etc.). For example, there were some pesticide non-detects which were rejected. The percentage of completeness of the pesticides should then be expressed. Another issue is if the rejections were concentrated in one assessment area, then this is an important fact.

It is important that no positive results were rejected, but the fact that a number of non-detects were rejected is also important because this lowers the confidence that all important analytes were detected. Some statements about this issue should also be made.

11. Section 9.1, Page 9-1. Paragraph 2, Sentence 1.

This section presents the contamination summary for the fate and transport analysis. This sentence states that the Phase II was limited to sediment analysis. However, surface water and biota samples were collected. In addition, sediment data was collected during the Phase III field effort. The fate and transport analysis should include all data. The contamination summary should be revised to include a summary of all data and list the contaminants that were selected for further analysis. In some cases, the contaminants can be grouped together such as for the non-carcinogenic PAHs, carcinogenic PAHs, DDT and daughter products, and so forth. The VOCs should also be included. This contamination summary should be presented by site assessment areas.

12. **Section 9.2.1, Page 9-1, Paragraph 3, Sentence 3.**

This section presents the physical and chemical properties that affect fate and transport and this sentence states that the chemical and physical properties used to evaluate fate and transport are found in Table 9-1. However, the actual physical and chemical parameters for each contaminantarenot displayed. A table should be added to include the fate and transport properties for each contaminant.

13. **Section 9.2.1.2. Page 9-5.**

This section presents a general discussion on the media properties affecting fate and transport. However, it does not address the specific effects these properties will have on the fate and transport of the contaminants. In particular, since a partitioning model was used to predict the transport and bioaccumulation of PCBs, this should be examined in detail for the pesticides and PCBs. This section should be expanded to discuss in detail the effects that the media properties have on the major contaminants.

14. **Section 10.3.1. Page 10-55, Paragraph 1.**

This section discusses the human exposure pathways and this paragraph discusses surface water exposure. It is stated in this paragraph that limited surface water samples were taken for ecological risk and that no surface water screening Criteria were exceeded. However, the data is not presented. Even though the data may have been taken for ecological purposes, it may have application to human health risk. In addition, the type of screening criteria is not presented. A summary table should be included for the surface water data and the screening criteria should be discussed.

15. **Table 10-12. Pages 10-55 and 10-56.**

This table presents the analytical results of the fish samples and a comparison with the RBCs. However, the data presentation in the table misrepresents the data and it appears at first that there are more than two fish samples. In addition, it is customary to sum the risk results over all contaminants. The following table is an example of how the data should be presented. It should be noted that the overall risk for one of the samples is 7×10^{-5}, which is a significant potential risk. Since the species is lower on the trophic scale than the game fish which are usually consumed and have DDT and PCBs bioaccumulated, it is likely that the tissue concentrations of the game fish will be higher. Therefore, there is a potential

concern for the consumption of game fish which can only be resolved by additional sampling.

Comparison of Fish Analytical Data with Fish RBCs

		Conc.	Fish Ingestion	Exceeds	Estimated
040J400601	4,4'-DDD	2.6	13	No	NC
	4,4'-DDE	12	9.3	Yes	1.E-06
	Aldrin	0.66	0.19	Yes	3.E-06
	Arochlor-	100	1.6	Yes	6.E-05
	Dieldrin	1.3	0.2	Yes	7.E-06
	gamma-BHC	0.53	2.4	No	NC
	gamma-	1.7	9	No	NC
	Lead	1.5			
Total Risk					7.E-05
040J400602	4,4'-DDD	3.8	13	No	NC
	4,4'-DDE	9.7	9.3	Yes	1.E-06
	Aldrin	ND	0.19	No	NC
	Arochlor-	90	1.6	Yes	6.E-05
	Dieldrin	1	0.2	Yes	5.E-06
	gamma-BHC	0.53	2.4	No	NC
	gamma-	1.7	9	No	NC
	Lead	2.2			
Total Risk					6.E-05

(NC: Non-carcinogenic)

16. Section 10.3.1, Page 10-56, Paragraph 1, Sentence 1.

This section discusses the human health exposure pathways and this paragraph discusses the risk screening presented in Table 10-12. This sentence states that the Fish Consumption RBC is based on the subsistence fisherman. However, a review of the exposure parameters used for the RBCs and the Exposure Factors Guidance indicates that the fish consumption rate is based on national consumption and not subsistence fisherman. Therefore, the estimated risk is not the most conservative estimate. The text should be changed to reflect these facts.

17. Section 103.1. Page 10-56, Paragraph 2.

This section discusses the human health exposure pathways and this paragraph discusses the use of a Thermodynamic Bioaccumulation Potential (TBP) Model. References for this model was not found. A copy of this reference should be provided to the EPA for review. In addition, the preference factor of 4 appears to be very low for PCBs which have a large

potential for bioaccumulation. In addition, the preference factor is likely to be different for shellfish and game fish. This model and the assumptions used in the model should be reviewed by EPA prior to screening.

18. **Section 10.3.1. Page 10-57, Paragraph 1. Sentences 3 and 4.**

This section discusses the human health exposure pathways and this paragraph discusses the inputs to the TBP Model. These sentences state that a log-normal distribution was assumed and the 95th UCL was calculated. Tables 10-13 and 10-14 present the calculations for the PCB concentrations and the Total Organic Carbon (TOC) concentrations for the entire OU 40. Since there are a large number of samples, the assumption of a log-normal distribution is not warranted. There is sufficient data to check the distribution assumptions. It is apparent for the equations that the uptake of PCBs by organisms is related to the local concentration of TOC. Therefore, some form of a PCB ratio to TOC should be used in the calculations. In addition, since the PCB distribution varies according to Assessment area, a separate calculation should be carried out for each one. Also, since this is a screening level calculation and the risk is inversely proportionally related to the TOC concentrations, the lower 95* UCL should be used for each assessment area. However, if a ratio of PCB to TOC is calculated, then the upper 95th UCL for the ratio should be used.

19. **Section 10.3.2. Page 10-58. Paragraph 2. Sentence 5.**

This section presents the uncertainties in the risk evaluation and this paragraph discusses the uncertainties for the small fish evaluation. This sentence states that most contaminants accumulate in the bones and organs. However, this is not true for PCBs and organochlorine pesticides which accumulate in fatty tissues. This sentence should be revised.

This comment applies to all references (Section 10.3.3 and Section 11) regarding accumulation in bones and insufficient rationale to dismiss the small fish data.

20. **Table 10-15. Page 10-63.**

This table presents ranges of possible risk results by varying the input parameters to the TBP model. However, the rationale for the changes in inputs is not presented. In addition, the possibility of higher risks such as using a lower TOC concentration, a higher preference factor, or a maximum PCB concentration, is not presented. This table should be revised to include the upper limits of risk.

21. **Section 10.3.2. Page 10-64, Paragraph 3, Sentences 3 and 4.**

This section presents the uncertainties in the risk evaluation and this paragraph discusses the FDA action level for PCBs. The FDA Action Level of 3,000 ppb in fat is not entirely risk based but includes the concept that elevated PCB concentrations in meat may be unavoidable. In essence, this reflects the existing level of PCB contamination in meats. Therefore, the FDA action level has no relevance to this risk evaluation for Site 40. This paragraph should be removed.

22. **Section 10.3.3, Page 10-65, Paragraph 2, Sentence 1.**

This section presents the conclusions of the risk evaluation and this paragraph discusses the results of the TBP model. This sentence states that the results of the model suggests a risk greater than 10^{-6}, but between the EPA range of 10'' to 10^{-4} . However, this is not true because the actual risk range produced by the model was from 2×10^{-7} to 5×10^{-4}. The only scenarios when the risk which was calculated to less than 10^{-4} was when the concentration was assumed to be at the minimum value and/or the TOC was assumed to be at the maximum value. Therefore, the model actually indicates a potential cause for concern rather than being in the acceptable risk range.

23. **Section 10.3.3, Page 10-65, Paragraph 2. Sentence 5.**

This section presents the conclusions of the risk evaluation and this sentence discusses the TSCA requirement of 10 ppm for soils. However, the TSCA requirement for soils has no relevance for submerged marine sediments. This sentence should be removed

3.0 SPECIFIC COMMENTS

1. **Section 5.0, Page 5-1, Paragraph 2, Sentence 2.**

This section describes the field investigations methods and this paragraph discusses the analytical protocols. This sentence presents the analytical methods for the sediment samples. However, the analytical methods for the fish samples and surface water samples are not stated. This should be added.

2. **Table 7-1, Pape 7-3, Row: Footnote b.**

This footnote states that footnote b refers to the FDER screening concentration for sediment. However, this reference was not found in the references. This discrepancy should be resolved.

3. **Section 8.1.3, Pape 8-6. Paragraph 2. Sentence 2.**

This section is a discussion of the results of the data validation review of the calibration data. This sentence states that these QC deficiencies represented common laboratory practices. However, it should be stated that the QC deficiencies are within the normal fluctuations of laboratory function. This sentence should be revised accordingly.

4. **Section 8.1.5, Page 8-10. Paragraph 1, Sentence 1.**

This section is a discussion of the surrogate data validation. This sentence states that three surrogate %Rs were grossly outside QC Limits. However, the context and position of the paragraph suggests that pesticides are the subject of discussion. This should be clarified.

5. **Section 10.3.1, Page 10-58, Paragraph 1, Sentence 7.**

This section discusses the human health exposure pathways and this paragraph discusses the results of the TBP Model. This sentence states that the range of risks is presented in Table 10-14. However, the range of risks is presented in Table 10-15. This discrepancy should be resolved.

Summary

There are serious and significant deficiencies in this risk assessment and fate and transport evaluation that prevent drawing meaningful conclusions from this document. In my view, the additional sampling will need to be conducted and the report rewritten.

General Comments

Fate and Transport in Bayou Grande

Section 9.0 on Fate and Transport was boilerplate language that I have seen in other documents. It would have been very helpful to the understanding of the pattern of contamination if there had been an effort made to link the chemicals found in sediment with onshore sources and

to determine if tidal water movements could entrain and redeposit sediment. No attempt at all was made to understand these two issues in Bayou Grande. For example, on page 6-8, the text states that a tidal study would be helpful in understanding the influence of groundwater on surface water and sediments, but no indication of this increased understanding was ever presented in the document.

Inadequacy of the Risk Assessment

The assessment endpoints in the ecological risk assessment were too vaguely defined. In general, particular chemicals suggest particular assessment endpoints. Metals present at the site would be expected to be directly toxic, and an assessment endpoint that specified the level of both the diversity and abundance of the benthic macroinvertebrate community would be appropriate. Hence, a discussion of a control area, also lacking in this document, would be needed. For a more complete discussion of assessment endpoints, an ECO Update from EPA, "Ecological Significance and Selection of Candidate Assessment Endpoints" is suggested.' Additional discussion is available at the Oak Ridge National Laboratory website, http://www.ornl.gov.

Conclusions were drawn about human health and ecological risk at the site based on a sample of two fish - one killifish and one pinfish. This is an inadequate sample, especially based on the size the of the site.

There was no attempt to separate the risk assessment based on the four assessment zones. Indeed, I wondered why the four zones were specified in the first place. It would have made more sense to have performed a separate risk evaluation for each zone and to have included the wetlands and other on shore sources. This point harks back to the inadequacy of the fate and transport evaluation. The wetlands were mentioned on page 4-9, but only in a perfunctory way.

Specific Comments:

1. Page 1-2, Section 1.1. Even in this section, it was clear that the dynamics of sediment transport should have been considered.

2. Page 5-4. The common names of the animals used in the toxicity tests should be given.

3. Figure 6-1 and others. Contour maps for this and other figures might have helped to understand sediment transport and the location of contamination. False color showing levels of various contaminants (e.g. fig. 7-1) would have greatly helped understanding. Given the impenetrability of these figures, it is not surprising that the document did not support its conclusions.

4. Page 6-8,6-9. How does the time lag study for site 38 relate to site 40? The areas are on opposite sides of the base and are in different water bodies. Is it feasible to assume that the conditions in the bay mirror the bayou?

5. Page 6-9, 6-10. What is the correlation to the high tide sampling in the bay with the bayou?'

'ECO Update, Ecological Signficance and Selection of Candidate Assessment Endpoints, OERR Publication 9346.0-11FSI, EPA 540/F-95/037, Jan. 1996

The information presented suggested that the groundwater flow is toward the bay. Should some of the groundwater flow patterns demonstrate the some areas are flowing toward the bayou?

6. Table 7-1. Screening against risk based concentrations should occur in the risk assessment and not in the nature and extent section.

7. Page 10-4. The text points out that mapping exceedances identified areas of higher contaminant deposition. This is not correct. Deposition is indicated by fate and transport considerations which were notably absent from the document (see General Comments).

8. Page 10-5. The Office of Health Assessment in the Region 4 EPA is now called the Office of Technical Services.

9. Table 10-1 and UCL calculation. For initial screening in an ecological risk assessment, the maximum detected concentration should be used. Screening level ecological risk assessments should be conducted with all factors biased in a conservative direction.

10. Section 10.2.2, page 10-33. A figure should be included showing the sampling locations for the eco assessment and the contaminant concentrations.

11. Page 10-30. The screening assessment concludes that the risk to ecological receptors is low based on HQs less than 6. The threshold presented in many guidance documents is 1.

12. Table 10-5. Given its large home range, one wonders whether the Great Blue Heron adequately represents the assessment endpoint.

13. Page 10-64 and elsewhere. The exposure assumptions for the subsistence fisherman are never presented. It is unclear why such a receptor would even be considered in this risk assessment. In addition, the FDA action level for PCBs in fish is 2 ppm and is considered a level appropriate for occasional consumption - for example, those who purchase fish in the grocery store.