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March 11, 1997

Florida Department of Environmental Protection
ATTN: John Mitchell
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Site **2** Remedial Investigation Report, NAS Pensacola
Contract #N62467-89-D-318/0059

Dear Mr. Mitchell:

On behalf of the Navy, EnSafe/Allen & Hoshall is pleased to submit one copy of the response to comments for the Site 2 Remedial Investigation Report at the Naval Air Station Pensacola. These comments were previously discussed in the June 1995 partnering team meeting. **If** you should have any questions or need any additional information regarding this document, please do not hesitate to call me.

Sincerely,

EnSafe/Allen & Hoshall

Henry H. Beiro, P.G.
Task Order Manager

Enclosure

cc: Bill Hill, SOUTHNAVFACENGCOM - 2 copies
Ron Joyner, NAS Pensacola - 2 copies
Gena Townsend, USEPA - 1 copy
Denise Klimas, NOAA - 1 copy
Judeth Walker, NAS Pensacola - 1 copy
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Department of Environmental Protection
Draft Remedial Investigation, Site 2
NAS Pensacola, Florida

May 8, 1995 (John Mitchell comments)

GENERAL COMMENT:

We have concerns about some of the assumptive conclusions made throughout portions of the document based upon overall conditions of the Pensacola Bay system. These assumptions are based on previous studies which used different analytical methods and areas which were not part of the open bay system. This is particularly true of our departments sediment study. The document uses these data in a presumptive manner and combines all the data sets. Some of the data points were in the bayous which flow into the bay and are not representative of the open bay system. If one combines only those samples performed in the open bay, the percentage of metals and organic compounds is very small compared to the localized area of Site 2. The document presumes that the heavy metal contamination at Site 2 is indicative of the bay system in general, and may have been from other areas of the bay. However, NAS Pensacola discharged industrial wastes directly into the bay at a minimum of 34 years (1939-1973), p. 2-1). Any contamination found in the sediment at Site 2 is likely from the Naval Air Station, and any other contamination found in the open bay system may also be from NAS Pensacola rather then other sources. Rather then attempting to verify the sources within the bay we should concentrate on Site 2.

RESPONSE:

In general, most of the contamination found at site 2 is in finer grained sediments, silts or clays. There were a few exceptions to this specifically station I-0 and H-1 which were silty sands. The Navy believes this is due to an "eddy" caused by the shape of the shoreline and the carrier pier. The eddy reduces the energy for transporting sediments and encourages deposition in this area. The Navy believes the occurrence of contamination in this area is a combination of ubiquitous bay sedimentation plus Navy past discharges ceased 17 years ago. The Navy believes it has written a report that does describe the nature and extent of the sediment contamination at Site 2 and agrees that searching for additional sources is beyond the scope of this investigation.

SPECIFIC COMMENTS:

COMMENT:

1. Figure 5-3 (Sediment Sampling Locations)

   A figure should be included which shows the location of the reference (Background) samples.

RESPONSE:

The legend clearly specifies a symbol for reference locations and the map does use that symbol.

COMMENT:

2. Section 7.2 (Sediment Chemistry)

   On page 7-10, under Metals the subsection, the document indicates mercury does not occur naturally in the environment. This is not correct.

RESPONSE:

The 12/22/96 revision of the document makes the same statement on page **7-15.** This statement is not correct and the sentence will be removed.

COMMENT:

3. Section 10.2.2.2 (Effects to Benthos)

   a. Subtitle **USEPA** Region IV **SSV** Comparison

      This section indicates "the term "exceeds" refers to those concentrations found at Site **2** which were above the **USEPA** Region IV SSVs." How is the term "exceeds" used in relation to those constituents which do not have an **SSV** guideline? In most cases for other media, twice background is the accepted norm. Should this not also be the case for sediment?

b. Subtitle FDEP Metal-to-Aluminum Ratios

This section states "FDEP (1988) states "that lack of complete digestion may give metal-to-aluminum (MTA) ratios which appear unusually high." This is a misquote from the FDEP document. Specifically, the document (FDER, 1988) states on p. **33** item **2.** that "if aluminum is not completely released through digestion, metal to aluminum ratios may appear unusually high." Therefore this is one of the limitations of using the metals-to-aluminum ratio with the CLP process. We believe using this process with the CLP-PQL data may be quality relevant, but not conservative. If the total digestion method had been used the contaminant values would have been higher than the CLP-PQL analysis. However, using the MTA method would have then been quantitatively relevant.

c. Subtitle USEPA Region III Interim Ecological **Risk** Assessment Guidelines

We are unfamiliar with the Region III ERA guidelines. There is a more recent USEPA draft document which **has been** proposed which we believe provides better guidelines for performing **an** ERA. The document is titled: ***Ecological Risk Assessment*** *for* ***Superfund: Process*** *for* ***Designing and Conducting Ecological Risk Assessments*** (Draft, September ***26,*** 1994).

RESPONSE:

a. The word "exceeds" is simply meant to imply a greater value. No comparison was made to background because of the extensive mixing at the site with bay sediments. In addition, the mutually agreed upon work plan and sampling plan did not specify the location of possible background areas for sampling. At the time of the study the Navy did not have analytical data to support a "background" comparison. The Navy can provide the analysis of other sediments, from the Site **42** study, to be used in comparing the values at Site **2** with nearby concentrations. Analytes which do not have a SSV or FSQAG may be beyond the scope of this nature and extent investigation. SSV and FSQAG numbers are based on known responses to certain analytes. The Site 2 investigation found analytes that have limited **if** any data to describe their dose response. The Navy believes the nature and extent of these "non-SSV/FSQAG" analytes have been assessed. The accepted norm of twice background could be used. The Navy herein requests guidance to define background for Site 2. The "value-added" of these "non-SSV/FSQAG" analytes is not clear and the Navy herein requests specific guidance to assess the toxicity of these analytes.

b. The Navy apologizes for the misquote. We plan to change the text to reflect the exact wording and specify the page and paragraph from which it was taken. However, neither meaning nor intent of the quote has changed. The Navy agrees

and asserts that if incomplete digestion occurs higher metal to aluminum ratios will occur. If the ratios are biased higher by the method, the method is more conservative in comparing site sediments to sediments taken over the entire state. If these ratios were biased lower by incomplete digestion analytes of concern could be masked by the comparison as insignificant.

The Navy has provided in the 12/22/96 version of the Site 2 RI, a comparison of the total digestion using HF with the CLP method. We found no statistical significant difference between the methods.

c. The 12/22/96 version of the Site 2 RI referenced many guidance documents including the document suggested.

COMMENT:

4. Figures **10-1** (Percent **SSV** Exceedance for Metals Site **2** vs **FDEP 1993)**

The sampling data used for **this** figure included samples not within the open bay system, but used all of the data points which included bayou samples and non-point source samples. If any comparison were to be made at all, it should be related only to those samples which are within the open bay system and not necessarily non-point source related.

RESPONSE:

The **sampling data** was not chosen because it was or was not "open bay system", but because of the variety of bottom types similar to Site **2.** The Navy believes similar bottom type, therein similar physical conditions governing the deposition of sediments, to be more important for this comparison than "open bay system". Again, the purpose of **this** figure was to illustrate the relative magnitude of metal concentrations founds at Site **2** with other samples taken in Pensacola Bay.

COMMENT:

5. Section **10.2.2.3**(Metals)

As stated previously, using the FDEP metal-to-aluminum ratio is inappropriate as total digestion was not used. If total digestion was performed, higher metal values would have been detected then what was found using the **CLP-PQL** methodology. The MTAs then would have been relevant. Also, any metals comparisons made related to Figure 10-1 should be eliminated.

This section also indicates that any dredging of the sediments could increase mobility and bioavailability of contaminants. **This** is true, but bioavailability and mobility has a likelihood of occurring based upon low total organic carbon **(TOC)** in the sediment throughout the site and due to hydrologic conditions in the open area of the bay, respectively.

RESPONSE:

The Navy is well aware that **FDEP** believes this method of comparison taken from State funded research to be inappropriate. However, the State did not provide comparative studies exhibiting the inappropriateness of the methods. The Navy has provided such data in the **12/22/96** Site **2** RI exhibiting the statistical comparability of the methods. Our research does not indicate that the total digestion method using HF yields any higher metals with the exception of aluminum, therein raising the metal to aluminum ratios. To illustrate, if arsenic were equally digested by both the total digestion method using HF and the **CLP** method but aluminum was not equally digested by the **CLP** method as suggested by the FDEP (1988), the ratios would be different. An example for arsenic, metal to aluminum ratios, could be represented by:

$$\frac{As}{Al} \qquad \text{or} \qquad \frac{As}{Al\text{-}x}$$

where *Al* represents complete digestion of the aluminum and *Af-x* represents some portion of the aluminum or alumino-silicates that fails to digest. The first case, ***Al,*** metal to aluminum ratios would appear lower than the former case, *Al-x*. The higher ratios being due to the **CLP** digestion incompletely dissolving all the aluminum. Higher ratios indicate an anthropogenic source to a natural condition. The Navy **used** these comparisons to show Site **2** sediment concentrations are comparable to other Florida sediments.

Figure 10-1 simply exhibits a comparison of two data sets. The goal of this comparison was to illustrate to the audience the relative magnitude of metals found at Site **2** with other locations in Pensacola Bay. Site 2 offered a variety of bottom **types** as did the FDER **(1988)** study.

The statement in the document relative to dredging effects was not appropriate at this time and will be removed from the text.

COMMENT:

6. Section **10.2.2.4**(Organics)

On page **10-27,** the document refers to a particular sampling station (Station **18)** performed by FDEP in **1993,** and compares this to the maximum value for total PAH at Site **2.** A map location of Station **18** is not identified anywhere in the document. The highest PAH values in the FDEP study were located in Bayou Chico, not the open bay system. Any comparison to the **FDEP** PAH values should be eliminated from the document unless they are only qualitatively compared to the open bay system samples, and non-point source related samples.

Also, this page states that the "low percentage of exceedances (of the **SSVs)** at Site **2** was obvious." Referring to our ensuing comments, on Appendix B about levels of detection (LOD) for PAHs, of course exceedances were rare. Further comparison to the FDEP-NOAA data in Figure **10-8** is therefore misleading, **as** the department had LODs for PAHs as low as **10** ppb, and all below **330** ppb.

Again on page **10-29,** 2nd paragraph, these comparisons are made. This paragraph also indicates the PAH **risks** to ecological receptors are not critical based on these comparisons and from Eisler's (Eisler 1987b) analysis for higher vertebrate species. Based on the levels detected, there is risk to the benthic invertebrate community.

RESPONSE:

The primary source of contaminants for the Site **2** investigation was assumed to be Building **71.** Building **71** did not historically use PAH compounds. Possible sources of the PAH compounds range from stormwater runoff to shipping traffic in the Intracoastal waterway. The purpose of the discussion was to illustrate the relative magnitude of concentrations found at other locations by FDEP. The PAH comparisons with the FDER **(1988)** did provide similar bottom **type** to those sediments found at Site **2.** The Navy will again review the text to clarify the **need** for similar depositional environments.

COMMENT:

7. Figures **10-8** (Percent **SSV** Exceedance for PAHs Site **2** vs. FDEP **1993)**

Again, the sampling data used for this figure included samples not within the open bay system. See comments #3 and **#5.**

RESPONSE:

Again, the description of "open bay" is vague and not meaningful. The Navy contends that similar bottom type indicates similar physical conditions for deposition.

COMMENT:

8. Section 10.2.5 (Conclusions)

The next to last paragraph on page 10-33 should be removed. Whether Site 2 ecological risk is lower than the rest of Pensacola Bay has not been determined and is not relevant. This specific site is adjacent to a National Priority Listed site and data show levels of contamination which are likely injurious to the environment. The purpose of the FDEP sediment quality guidelines and the Region IV SSVs were specifically designed for this type of risk evaluation, yet appear to be arbitrarily used in this document.

The last paragraph on page 10-33 recommends no further remedial action is required for this site. This is contrary to what was agreed upon in our teleconference on February 8. It was agreed at that time that sediment toxicity tests would be performed on the sediment at Site 2 and a work plan for these tests would be submitted. Also, in the Remedial Investigation work plans for Pensacola Bay and as agreed upon in previous discussions during the past two years, if SSVs are exceeded then Phase IIB (sediment toxicity studies) would be performed.

RESPONSE:

Section 10.2.5 "Conclusions" has been rewritten and is now 10.3.5. The Navy knowingly accepts that NAS Pensacola is an NPL site and that discharges from adjacent sites may be resident at Site 2 along with other contaminants from shipping lanes and the intracoastal waterway. The purpose of these paragraphs was obviously lost due to a lack of clarity and has been reworded.

COMMENT:

9. Section 11.0 (Conclusions and Recommendations)

Refer to Comment #7.

Also, on page **11-1,** the section states "historical records indicated that operations in facilities adjacent to Site **2** may have impacted the site from **1939** to **1973.** It should be noted based on previous site history information in the document that discharge of hazardous substances may have occurred **as** far back as the **1920s** and in some instances **as** late as **1979.**

RESPONSE:

The Navy believes the period between **1939** to **1973 to** be the most descriptive for the historical discharges from buildings along the waterfront into the Site **2** vicinity. Some of the buildings were constructed in the **20's** and all plating operations were **ceased** in **1979 as** previously stated in section **4.** However, from **1939** to **1973,** known industrial wastes were documented to have been discharge directly into the bay as stated in Sections **4** and **11.**

COMMENT:

10. Appendix A (Sediment)

There still appears to be a problem with the labs meeting the required detection limits (DLs) for some constituents. Limits for arsenic and cadmium were too high in numerous samples. This was also true for the DLs for PAHs. Specifically:

a. The required LOD for cadmium is 1.0 ppm, yet the laboratories LOD was consistently higher than this number. Similarly, the LOD for silver was not achieved regularly.

b. The LOD ppb for Total PCBs is **33** ppb. However, the LOD for the individual aroclors varied from 40 ppb up to **200** ppb.

c. One of the most perplexing results **is** for PAHs (LOD = **330** ppb). The LOD were hardly ever reached. For some samples, the LOD reached as high as 6,000 ppb, although most were below 1,000 ppb.

We do not understand why undetects were often found at levels much higher than what is required by the CLP-PQLs. This inconsistency needs to be eliminated. We have rarely found this a particular problem at other federal facilities. The conclusion on page **8-17** that the quality **of** the analytical work was satisfactory seems suspect, and our sediment management group disagrees with this conclusion.

RESPONSE:

Sediments are unique to analyze because two phases/matrices are involved, both solid and liquid. To say that matrix interferences is the problem, is not a complete answer. The reported data is required by "wet weight", that is we divided the dry weight analysis by the percent moisture as per the method procedure. This does generate some odd numbers when a "no detect" occurs. For example: if benzo-a-pyrene was not detected, the analyst would assume the dry weight quantitation limit, say **330** ppb, then divide by the percent moisture, say 60%! The result is 330/0.60 or 550 ppb. Other Federal Facilities obviously are reporting their data in different terms or are using different methods. The Navy welcomes specific guidance in solving **this** problem. In Phase IIB, the Navy specified to its contractor to require the laboratory to meet lower detection limits. The laboratory did provide lower analytical detection, however the adjustment for moisture content and occasional **matrix** interferences continued. The analytical methods used were approved in the sampling and analysis plan for Site **2.**

Department of Environmental Protection
Draft Remedial Investigation, Site 2
NAS **Pensacola, Florida**

June 22, **1995** (David Clowes comments)

COMMENT:

1. Site History (Section **2.2):** Besides noting that approximately **83** million gallons of untreated industrial wastes were **dumped** into Pensacola Bay near Site **2, this** section should state the Site **38** (NADEP Building 71 and the associated IWTP Sewer Line), located directly upgradient of Site **2,** has groundwater contamination that contacts the seawall (and has spread along the seawall) that probably discharges to Pensacola Bay.

RESPONSE:

We disagree that this information should be located in Section 2; site history. We believe this information is more appropriate and has been located in Section **4;** Preliminary Survey.

COMMENT:

2. With the highest sediment contamination closest to the discharge outfall of Building 71 (location **H1),** and a groundwater plume emanating from the Building **71** area, that contacts the seawall and has spread east along the seawall and possibly into Pensacola Bay; sediment and surface water samples should be collected in Pensacola Bay adjacent to where the groundwater contamination contacts the seawall (near and slightly east of monitoring well 38S13 - see Figure **7-14** from the December **8, 1994** TI for Site **38).** Sediment samples should also be collected to the west of location **U1,** where outfall **J** discharges (Figure **4-3).** Note, the proximity **of** these contamination sources to the Bay supersedes the argument not to sample these areas due to non-fine grained sediment/low TOC as areas of probable low contamination.

RESPONSE:

Phase IIB collected samples again at H-1 and at the toe of the seawall I-0 to verify the presence of contaminant in sediment. U-1 was not sampled by Partnering agreement.

COMMENT:

3. The conclusion of this document directly contradicts the Tier I Partnering Team decision agreed to by all agencies (Conference call, February 8, 1995). The decision was that this site is not appropriate for No Further Action due to metals, DDT, PCBs and PAHs in sediments above SSVs, and that ten sediment toxicity bioassay samples should be collected. This decision was based on previous Tier I Team decisions, that if contaminant levels detected in sediments are above SSVs, Phase II assessment (toxicity bioassay sampling) would be conducted to determine if ecological receptors are effected. Again, FDEP strongly recommends the necessity of toxicity samples, as stated in the comments to the November 1994 Technical Memorandum, the conference call, the last Partnering meeting, and in the enclosed comments to the risk assessment from Ms. Fugler and Ms. Mora-Applegate. A work plan describing the specific location of the samples, the test organisms, detection limits, etc. should be submitted before these samples are collected. The work plan should be submitted after the additional sediment samples requested in Comment No. 2 are obtained, unless bioassay toxicity samples are collected currently. Then, when all the samples have been collected and analyzed, the draft RI should be resubmitted.

RESPONSE:

The agreed ten sediment and toxicity samples were taken representing the phase IIB sampling. As agreed by the Partnering team, the remedial investigation report will be reissued.

COMMENT:

4. Appendix A: Though CLP protocol was followed for sampling, detection limits are above CLP PQLs in sediments, and above Florida Surface Water Quality Standards (62-302 F.A.C.) For surface water (lead, mercury, nickel, silver, DDT, PCBs, dieldrin, and endrin). Other analytical methods (such as SW-846) should be used when analyzing the recommended additional sediment samples (Comment No. 2) and the toxicity bioassay samples (Comment No. 3); so the detection levels are at or below the new Florida Sediment Quality Assessment Guidelines (November 1994). Note, the argument of detection limit problems due to matrix interference does not discount exceedances. If matrix interference is a problem then alternative analytical methods should be used.

RESPONSE:

SW-846 methods are identical to CLP methods. The same type equipment and methods are utilized. The primary differences are the reporting requirements. We used analytical methods approved and agreed upon within the sampling and analysis plan.

COMMENT:

5. Contaminants detected in surface water should be documented in a table, as the sediment data was presented.

RESPONSE:

The Navy agrees and will add the appropriate tables to an appendix and add references to the text.

Florida Department of Environmental Protection
Risk Assessment Review for NAS Pensacola Site 2

April 7, 1995 (Jane Fugler Comments)

COMMENT:

1. The risk assessment (RA) document should be a stand-alone document, since it is usually reviewed by someone other than the Project Manager. Therefore, the following information is expected in a RA, which was not included here:

a. A list of the state's threatened and endangered (T&E) species expected to be found at this site;
b. A list of the aquatic and T&E species observed at this site;
c. A data ***summary*** table for all contaminants detected in each media and that **contains** the frequency of detection, range of detects, average concentration and background concentration (from site specific studies);
d. **A** brief sentence of which guidances were used for this RA and any deviations from those guidances;
e. The environmental setting;
f. Contaminant fate and transport mechanisms that may exist at the site;
g. Ecotoxicity associated with contaminants and likely categories of receptors that could be affected; and
h. The complete exposure pathways that may exist at the site from contaminant sources to receptors that could be affected.

RESPONSE:

The Navy does not agree that a risk assessment should be stand alone. The risk assessment was provided as part of a remedial investigation, the requested information in items 'a' thru 'h' are included in the remedial investigation report.

COMMENT:

2. The Department has established new sediment quality assessment guidelines that should be applied here. It appears the Federal numbers were used and not FDEP's for this study. Attached is a copy of this list, the TEL values are used as the Sediment Screening Values (SSV).

RESPONSE:

The latest values were used for the 12/22/96 revision of the Site 2 remedial investigation.

COMMENT:

3. CLP analytical methods were used instead of the sediment digestion methods **FDEP** used for the coastal sediment study. This is like comparing apples and oranges. Also, there is repeated reference that this site is no worse than areas nearby based on the coastal sediments study; this study included nondeveloped and highly developed areas. On-site naturally occurring background levels should be used for comparison, if they want to challenge the guidance values and standards.

RESPONSE:

The Navy disagrees with the opinion that the CLP digestion and the FDEP digestion methods are like comparing apples and oranges and requests references to substantiate such claims. The Navy agrees to challenging the guidance values and standards by using ubiquitous not natural constituents. Please provide guidance on how the comparisons can be made if not by the methods provided in the 12/22/96 Site 2 RI.

COMMENT:

4. All the metals discussed **As,** Cd, Cr, Cu, Pb, Hg, Ag, Zn and total PAH, total DDT, and PCBs showed detections above the federal SSVs. I disagree with their conclusion that no further action is needed; further assessment should be pursued for the contaminants that were not included (see comment 1c) and all the contaminants that exhibit complete exposure routes or toxicity to the potential receptors. The most recent draft from EPA September 26, 1994 "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments" discusses the steps needed for a RA. In addition, Silver was not included in Tables 10-1 and 10-2, but was included in the discussion. Nickel was analyzed, but not included in the discussions or tables. A brief review of the sediment lab data found the detection limits varied greatly between samples. There may be more detects than indicated.

RESPONSE:

The requested Phase IIB sampling was conducted and verified suspected hits of metals in sediment. The conclusions for 12/22/96 version of the Site 2 RI have been completely rewritten requiring a feasibility study to be implemented concerning these metals.

COMMENT:

5. The sediment sample description on page 5-9 explains that the samples were collected with a split-spoon sampler, transferred into a stainless steel bowl, then put into sample jars, and later VOC analyses were conducted on these samples. Page 5-19 explains they were collected first to minimize degassing. Which is correct? I recommend more care in reducing volatile compounds during sample collection, such as collecting directly from the core before removal from the split-spoon.

RESPONSE:

Although not clear in the text, the sampling and analysis plan required the use of a split barrel sampler. Poor recovery in the split barrel sampler resulted its replacement with a Ponar dredge. No reference in the text is provided as to sampling order. The text will be changed to reflect the reason for a field change and the sampling order in accordance with the ComQAP for NAS Pensacola.

COMMENT:

6. Page 4-11 lists wastewater containing radium paint waste as a potential contamination source for this site. Was radium analyzed for in previous studies and later determined to not be a concern?

RESPONSE:

Radium paint was not used in area of the base. This statement is in error and shall be removed.

COMMENT:

7. It was stated the surface water was not a concern, however I understand there was matrix interference during the water analyses. Surface water contamination should be reassessed.

RESPONSE:

The matrix interference was not determined and was reanalyzed during Phase IIB. It should be noted that the surface water analyzed was seawater and not a freshwater discharge to the bay.

COMMENT:

8. Figure **4-3** shows outfall J west of seaplane ramp **384** and Building 76. Figure 5-1 shows the transects used for sediment sampling, however this outfall was not included in the transects. Sample location Ul is the nearest to **this** outfall and showed contamination. The outfall should be considered for further assessment.

RESPONSE:

During Phase II **A,** transects were selected to reduce cost based on grain ***size*** and total organic carbon data. The outfall mentioned is not active and only discharges street runoff. The resampling during Phase IIB did sample at **U-2** to evaluate the extent of such contamination.

Human Health Risk Assessment

COMMENT:

9. On page 10-44, first paragraph, second sentence, your name is misspelled "Davi Clowes".

RESPONSE:

Reference **to** David Clowes has been removed in the **12/22/96** version of the Site **2** remedial investigation.

COMMENT:

10. They used 20 g/d for fish ingestion rate which is fine. However, HRS/DEP is in the process of developing more accurate ingestion rates for different fish groups (i.e. finish and shellfish), they currently recommend using **30** g/d and EPA's guidance (March **7, 1995,** Risk-Based Concentration [RBC] Table) recommends **54** g/d.

RESPONSE:

U.S.EPA's RBC Table uses **54** g/d for a subsistence fisherman scenario, an assumption which is dependent upon *both* the ingestion rate and the exposure frequency. To assess a recreational scenario, the exposure frequency could be decreased while increasing the tissue ingestion rate, or both could be decreased. Ingestion rates differ for exposed populations. For example, 6.5 g/d is the average consumption rate of fish and shellfish from estuarine and fresh waters, **14** g/d is the average consumption rate of **fish** and shellfish from the marine, estuarine, and fresh waters by the general U.S. population, 30 g/d is the average consumption of fish and shellfish from marine, estuarine, and fresh waters by the 50th percentile of recreational fishermen, and **140** g/d is the average consumption of fish and shellfish from marine, estuarine, and fresh waters by the 90th percentile of recreational fishermen (U.S. **EPA** *Guidance for Assessing Chemical Contaminant Data For Use In Fish Advisories,* Volume 1, **1993).**

Assuming a non-subsistence or recreational scenario, **140** g/d would be applied. However, the exposure frequency would be significantly reduced for a non-subsistence scenario, such as assuming a recreational fisherman would go crabbing once every other week, or approximately 25 times per year. Because the relationship between exposure frequency and ingestion rate are linear, equal changes would cancel out, and the point would be moot. Ingesting **140** g/d for **25** days per year is approximately equal to ingesting 20 g/d for **175** days per year or **54** g/d for **64** days per year. This results in exposure estimates **18.5%** of that which would be estimated for subsistence fishermen. Incidentally, the 20 g/d ingestion rate is approximately equal to the serving size suggested in cookbooks, and crabs are not available for a portion of each year.

COMMENT:

11. Sediment and surface water contact should be consider as potential risks. EnSafe has already stated that crab fishing occurs at this site. It is reasonable to assume that occasional swimming will occur (intentional or otherwise). **If** this has already been considered, the justification for exclusion should be included.

RESPONSE:

Sediment and surface water were considered as potential risks. As mentioned in the human health risk assessment, no chemicals of potential concern were identified in surface water. Sediment contamination was identified at depths which would preclude frequent, chronic exposure. Swimming is prohibited and is monitored by Naval security near the shore. In addition, swimming near the shipping channel is dangerous, prohibited, and would be monitored by the U.S. Coast Guard. The justification for including and/or excluding exposure pathways and media were tabulated in the human health risk assessment on pages 10-113 through 10-115.

COMMENT:

12. There are inconsistencies between the text and figures. Figure 10-9 lists the exposure frequency as 175 d/yr, but page 10-50 states an exposure frequency of 365 d/yr. The 175 days are acceptable, if it is true that crabbing only occurs here for six months within a year.

RESPONSE:

Both exposure rates are correct in the appropriate text. Do not confuse an exposure rate for blue crab ingestion with an annual exposure frequency, both of which are required in the equation. The Navy will make changes as necessary for clarity.

As to the truth of a six month crabbing season, the Navy suggests FDEP contact the Florida Department of Fish and Game for additional information.

COMMENT:

13. Based on the latest RBC guidance, the AT-N should be 10,950 for adults and the exposure duration, 30 in tables 10-7 and 10-9. Also, there is no distinction between adults and children for the fish consumption rates in the RBC.

RESPONSE:

In accordance with **RAGS,** the averaging time should equal the exposure duration in years times **365** days per year. **As** discussed in **U.S.** EPA's Risk-Based Concentration Table, fish tissue ingestion RBCs are based on adult exposure.

COMMENT:

14. In Table 10-7, o and n footnotes are not listed.

RESPONSE:

Typographical errors in tables and figures will be revised accordingly.

COMMENT:

15. No explanation **was** provided why subsistence fisherman were not included. This would change the ingestion rate and other parameters.

RESPONSE:

The subsistence fisherman is a scenario that assumes year-round exposure, which would not be the case for crabbing. This was addressed in the text of the human health risk assessment, and the blue crab was used as a **risk** indicator based on the likelihood of exposure, as agreed upon by the Tier I Partnering Team.

COMMENT:

16. The crabs are not good representatives of Site *2* aquatic inhabitants, because of **their** mobile nature. Unless the contamination detected is specific to Site **2** or the crab's habitat is within Site 2, other consumable species must be used for the food ingestion route that meet this criteria.

RESPONSE:

As discussed in the human health risk assessment, the Partnering Team agreed that blue crabs would be good risk indicators because crabbing does occur near site 2, and crabs would metabolize PAHs more slowly than fish. When the blue crab was selected by the Team, no other species were suggested. If we are to revisit the site, please specify what species would be appropriately used as a risk indicator, if not the blue crab.

Florida Department of Environmental Protection
Risk Assessment Section, Site 2
NAS Pensacola

April 17, 1995 (Ligia Mora-Applegate Comments)

COMMENT:

1. As discussed with you and Jane, the document does not stand on its own.

RESPONSE:

The Navy disagrees with this comment in that the **risk** assessment is a complete document within the remedial investigation for Site 2.

COMMENT:

2. The FDEP sediment screening criteria are exceeded. In my opinion, a sediment toxicity bioassay should be conducted.

RESPONSE:

Phase IIB sampling was conducted evaluating the **risk** to ecological receptors. The results of that study is included in the 12/22/96 remedial investigation for Site 2.

COMMENT:

3. The units in Table 10-15 need to be specified.

RESPONSE:

The document does not reference in the table of contents nor in the text a table or figure 10-15. Please clarify.

COMMENT:

4. The FDEP acceptable **risk** level is 1.OE-06.

RESPONSE:

The Navy requests reference to a documented requirement mandating 1.OE-06 as an acceptable **risk** level. In addition, please clarify if the 1.0E-06 **is** a cumulative threshold or one for individual chemicals? The Navy wishes to document this reference.

University of Florida
Bureau of Waste Cleanup
Draft Remedial Investigation, Site 2
NAS Pensacola, Florida

April 14, 1995 (Dr. Stephen Roberts, FSU, Comments)

COMMENT:

1. On page 10, the document states, "Species having the highest potential for contamination effects would include sessile benthic macroinvertebrates and other mobile species closely associated with the sediments such as crab, shrimp, and flounder." Each of these species represents a possible source of contaminant exposure for humans from ingestion, though the risks from only one (blue crabs) are estimated in the baseline risk assessment. The document contends that the estimation of risk based on ingestion of blue crabs (for 6 months out of the year) is conservative, but presents no clear rationale why it is necessarily more conservative than ingestion of other shellfish species or flounder. The assumption that risks from ingestion of blue crab would be as high or higher, than risks from ingestion of other species is key to the evaluation of baseline human health risks and must be more clearly and carefully defended.

RESPONSE:

As discussed on page 10-114 of the document, ingestion of crab tissue is the most likely exposure pathway to be completed and influenced by any contamination. Crabbing occurs near Site 2, which was also discussed in the document. No shellfish harvesting occurs at Site 2 due to the lack of a stable substrate for these organisms. Likewise only transient shrimp and flounder can be found on site. While blue crab are transient at Site 2, blue crab offer a scavanging lifestyle and habit on the bottom where the contamination is located. These organisms with a poorly developed hepatic enzymes do not breakdown PAH compounds effectively. The result is a bottom dwelling organism that bioaccumulates PAHs. The Navy believes the blue crab represents a harvestable quantity that is a good indicator of bioaccumulated PAHs.

COMMENT:

2. In Section 10.2.2, sediment concentrations should have been compared also with FDEP Sediment Quality Assessment Guidelines (SQAG), although the overall conclusions would

not change substantially. SQAGs values are somewhat higher than the USEPA Region IV SSVs for most of the contaminants in question here, though lower for total PAHs.

RESPONSE:

The **12/22/96** version of the Site 2 remedial investigation **did** incorporate these values.

COMMENT:

3. Table **10-15:** Concentration units are not specified. Some appear to be in ppm, while others are in ppb.

RESPONSE:

The document does not reference in the table of contents nor in the text a table or figure 10-15. Please clarify.

COMMENT:

4. Page **10-22,** line **9:** should read, Except for Stations A2, D1 and F2…"

RESPONSE:

This section was rewritten in the **12/22/96** version of the Site remedial investigation.

COMMENT:

5. **Pg 10-24,** "Silver": Not listed in either Table **10-1** or **10-2.**

RESPONSE:

This section was rewritten in the 12/22/96 version of the Site remedial investigation.

COMMENT:

6. Pg 10-39, last 2 lines, and pg 10-40, 2nd complete paragraph: A COPC should be carried through the risk assessment as a COC if it poses a risk $>10^{-6}$, regardless of whether the pathway risk is $> 10^{-4}$ cancer risk as a threshold for concern for an exposure pathway may reflect current USEPA policy, but is inconsistent with FDEP cancer risk goals.

RESPONSE:

It appears the reviewer would like to impose their personal feelings rather than reference FDEP cancer risk goals. The Navy is concerned that this is still an issue and respectfully requests documented policy or guidance. The Partnering Team should make a decision and apply it. In addition, anyone reviewing these decisions should be made aware of past agreements.

COMMENT:

7. Maximum concentrations of selenium and aldrin exceeded their screening values, yet these chemicals were eliminated as COCs based on comparison with a "reference concentration" (Table 10-4). This reference concentration was defined as twice the background concentration (pg 10-39), which was apparently measured at a single location. The very limited sampling upon which the reference concentration is based raises serious questions about the validity of its use to define COCs. Under the circumstances, selenium and aldrin probably should have been retained in the baseline risk assessment.

RESPONSE:

At the time the draft was published, only one sample analysis was available. The Navy now has tens of samples of similar bottom type that can be used to assess background conditions. These tables and text will be changed to reflect the additional data.

COMMENT:

8. Pg 1040, line 5 under "10.3.3.5 COPCs in Tissues": "...are denoted in the tables by the numerical symbols of 4 and 5." Symbols 4 and 5 do not appear in the tables.

RESPONSE:

The Navy agrees to make this change.

COMMENT:

9. Pg 10-40, line 6 under "10.3.3.5 COPCs in Tissues": "...shown in Table 10-5" should read Table 10-4.

RESPONSE:

The Navy agrees to make this change.

COMMENT:

10. Pg 1048, first paragraph, lines 6-8: This sentence indicates that the 95% UCL was used to compute risk (if less than the maximum concentration),'while other portions of the document indicate that only the maximum concentration was used (see pg 1045, last two sentences and pg 10-67, line 5 under "Statistical Estimation of Exposure Point Concentrations"). Which is it?

RESPONSE:

Please refer to page 10-116 through 10-118 of the document, which summarizes the Statistical Estimation of Exposure Point Concentrations. Table 10-11 shows UCLs for each COPC. These risk tables were supposed to include the EPCs. New tables will be generated to provide this data.

COMMENT:

11. Pg 10-50, second paragraph under "10.3.4.5", last sentence, and elsewhere in the document. The exposure frequency is listed here as 350 days, but elsewhere (e.g., Table 10-7) as 175 days. Which is it?

RESPONSE:

The 350 days is the exposure frequency. The 175 days refers to the exposure duration for the harvesting of blue crab since blue crabs are only harvested about 6 months of the year.

COMMENT:

12. Pg 10-52: The tissue intake rate-ages 1-6 is listed here as 20,000 mg/day, but in Table 10-7, as 2,000 mgfday.

RESPONSE:

The Navy agrees to make the typographical change.

COMMENT:

13. Table 10-7: More contradictions. Footnote "b" says the exposure frequency is 350 days/year, while the tabulated value above is 175 days/year. Also, there is no footnote corresponding to superscripts "n" and "o" appearing in the table.

RESPONSE:

The Navy agrees to make the typographical change.

COMMENT:

14. Table 10-9, pg 10-63: Confusion regarding the assumed tissue ingestion rate and exposure frequency (see Comments 11 and 12, above) affect the risk calculations in Table 10-9. For example, the cancer risk and adult HQ calculations are correct if an exposure frequency of 350 days per year is assumed (but not 175 days per year). The child HQ is correct if an ingestion rate of 20,000 mg tissue/day is assumed, and not 2,000 mg/day as stated in Table 10-7.

RESPONSE:

The Navy agrees to make the change to clarify the text.