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NAS PENSACOLA
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April 30, 1997

U.S. EPA
ATTN: Gena Townsend
345 Courtland Street, NE
Atlanta. GA 30365

RE: Remedial Investigation Report for Site 38, NAS Pensacola
Contract #N62467-89-D-318/0059

Dear Ms. Townsend:

On behalf of the Navy, EnSafe/Allen & Hoshall is pleased to submit one copy of the response to comments for the Remedial Investigation Report for Site 38 at the Naval Air Station Pensacola. 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
John Mitchell, FDEP - 1 copy
Denise Klimas, NOAA - 1 copy
Judeth Walker, NAS Pensacola - 1 copy
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Review of Draft Remedial Investigation Report for Site 38
NAS Pensacola, Florida
Response to U.S. EPA Region 4

(Gena Townsend, 12/16/96)

GENERAL COMMENTS

COMMENT:

1. This risk assessment has several serious deficiencies: the lack of consideration of subsurface soil samples, use of the FI/FC factor, missing exposure pathways, flawed screening for the COPCs, and treatment of nondetected values in the statistical summaries. **Also** the presentation of the "risk" maps tend to show risk estimates that are higher than the average **risks.** Corrections of these deficiencies will require some recalculation as well as major text revisions.

RESPONSE:

The text is being revised for clarity. After discussing the risk assessment in question with USEPA and FDEP, both parties stated that the risk assessment was not performed incorrectly and that revisions requested were for clarity. After more explanation, recalculation was determined to be unnecessary and risk maps were determined to be a useful supplement to what is typically required by RAGS. The Navy can only note the general comments above for future consideration, although the comments above are apparently detailed below. In the comment above, the reviewer has failed to communicate specific requests for inclusion in the document.

COMMENT:

2. Section 10.2.7, Pages 10-13, 10-17; Section 10.2.10, page 10-56; Apps. N, O. Use of an FI (fraction ingested from contaminated source) term is appropriate to assess "hot spot" situations. This **risk** assessment, however, has used FI inappropriately. The FI term should not be used to account for the fraction of the site that is not paved or not covered by buildings. In the case pavement covering large parts of a site, the exposure unit (for

surface soil) becomes the area that is unpaved. The soil/dust that the individual incidentally ingests would then be assumed to come entirely from the unpaved portion of the site. Use of an FI term would be appropriated if the majority of that unpaved area is uncontaminated.

Tables **N-3, 0-3** list FI percentages used to adjust exposure point concentrations (EPC). Determination of the FI for inorganic chemicals - said to be based on "number exceeding RBC/number analyzed" - **is** not appropriate. Once a chemical is selected as a COPC, the EPC is usually determined by using all the **data** for the exposure Unit area. Use of an FI term would indicate the remainder of the exposure unit area, outside of the "hot spot", has none of that particular chemical. This assumption is invalid for most inorganics. FI determination by "frequency of detection" is not appropriate for groundwater which should use a simple average of the "hot spot" wells to derive the EPC.

RESPONSE:

The text is being revised for clarity. FI/FC is appropriately used to assess site-wide exposure, which is consistent with USEPA Region IV comments and guidance provided for other federal facilities. FI/FC was not used to account for exposed soil, which would be a separate assessment of current site conditions. FI/FC was explained on various pages, such as 10-56, 10-62, and 10-86, as well as Tables N-3 and 0-3. The text on page 10-8 states that all chemicals present in site samples were used to estimate exposure. This means both paved and unpaved soil sample locations were included. A list of currently unpaved soil locations is provided in Table P-6, which, like most information in Appendix P, is not a specific requirement of baseline risk assessments.

The number exceeding the RBC divided by the number analyzed gives an indication of the spatial distribution of excess risk. Chemical concentrations below RBCs would not influence the calculation of excess risk at that specific location, and were therefore eliminated. The FI/FC adjustment was made only if the maximum concentration was used as the exposure point concentration. In addition, risk was estimated for **each** sample **location and for each chemical of concern.** This is more information than is typically provided in baseline risk assessments, which are usually based on one exposure point concentration that is assumed to represent all sample locations or one exposure unit area.

COMMENT:

3. Section 10.2.7, Page 10-13, Paragraph 2, addresses exposure pathways (also see Table 10-1). However, the text does not address the scenario where the construction worker is exposed to subsurface soils, particularly along the sewer lines where construction or repair work may occur, In addition, risks to the current or future construction worker will be less than the future worker or resident, but before stating that the risk is to the construction worker is not significant, the risks should be calculated.

The air pathways are incompletely addressed. Although the soil data **do** indicate that volatilization is minimal, potential inhalation of re-suspended particulates should be considered, at least qualitatively.

RESPONSE:

The text is being revised for clarity. The Navy agrees a construction worker scenario is insignificant and will delete this scenario. The air pathways are addressed in Table 10-1, which qualitatively addresses particulates.

COMMENT:

4. Section 10.2.7, Page 10-18; App. P. The figures and tables in App. P showing "location-specific risk" do not follow the concept that estimated risk should be based on an entire exposure unit. In future submissions of risk assessments, it would be preferred that figures and tables such as these be presented as RGO (remedial goal option) exceedances so as to not misrepresent the risk results.

RESPONSE:

USEPA's preference is noted. Location-specific risk figures indicate the variability of exposure concentrations and specific compounds which contribute at each location, therefore, they do not misrepresent the risk results. Instead, they provide a more detailed assessment and address the spatial component often lacking in Baseline Risk Assessments. These were provided in addition to the two exposure unit area human health risk assessments (i.e., the Building 71 area and the Building 604 area), which were usually based on one exposure point concentration, assumed to represent all sample locations or

one exposure unit area as recommended in the comment above. The text is being revised for clarity.

COMMENT:

5. Section 10.3.1.5, gives the risk characterization results. For clarity, the future scenarios should be designated as such (e.g. "Hypothetical Site Worker" should be "future Hypothetical Site Worker").

RESPONSE:

The text is being revised for clarity.

COMMENT:

6. Appendix N and Appendix O, Tables N-1, N-2, 0-1, and 0-2, present risk summaries for Buildings 71 and 604, respectively. However, surface soils and subsurface soils are presented together in the tables. The surface and subsurface soils should be classified and screened separately. In addition, the SSLs (soil to leaching to water) are covered in Section 9, but it is not clear how these values were applied in the appendix tables. Each RBC value should be identified. Tables N-2 and 0-2 need to be revised using only the lower of the RBC values and Florida water criteria for groundwater screening. These tables should be included in the text, not in the appendix, and the table title should be revised accordingly.

RESPONSE:

Tables N-1 and N-2 are referenced on page 10-60, while Tables 0-1 and 0-2 are referenced on page 10-79 and 10-85. Tables N-1 and 0-1 contain surface soil data only and separately identify surface soil chemicals of potential concern for the two exposure areas. Tables N-2 and 0-2 contain only groundwater data, and separately identify groundwater chemicals of potential concern. Appendices N and O do not address subsurface soil, which is addressed separately in Section 9 as discussed on pages 10-10 and 10-11. Tables N-2 and 0-2 use only the lower of the RBC and Florida water criteria for

groundwater screening, as discussed on pages 10-9 and 10-10. USEPA's preference for including the tables in the text rather than in an appendix is noted, and the text is being revised for clarity.

SPECIFIC COMMENTS:

COMMENT:

1. Section 10.2.4, Page 10-8, Paragraph 0.

The text addresses limitations of analytical results by including estimated concentrations for nondetected parameters, using one half of the "U" value as an unbiased estimate of the nondetected. However, this procedure may underestimate concentrations, although such underestimation is likely to have a small effect in most cases.

Implicit in the use of this procedure is the assumption that all samples in the data set have exactly the same matrix effects on quantitation limits. This assumption is correct for groundwater samples, but is not true for soil samples. How estimates of nondetected concentrations were handled for diluted samples is not stated in the text. For example, if a sample was diluted and benzene was a nondetect at 200 pglkg and there was a sample in the set which had a "J" value of 6 pglkg, (the benzene contract detection limit was 10 pglkg) the unbiased estimate for a nondetect value for this sample would be 100 pglkg, not 3 μg/kg (one half of "J" value) or 5 μg/kg (one half of CRDL). The text should address a more basic procedure for using one half of the individual sample quantitation limit.

RESPONSE:

The text is being revised for clarity. Apparently, some confusion exists with respect to the CRDL and the sample quantitation limit (SQL). The SQL was used to determine assumed concentrations. Although samples diluted by the reporting laboratory have higher detection limits, the original detection limit was used, rather than the higher detection limit from the diluted sample. Using the example of the diluted benzene sample from Comment 1, the SQL is 10 pglkg, which would be compared to the "J" value of 6 pglkg. Consequently, 3 μg/kg would be assumed instead of 5 μg/kg. As mentioned in Comment 1, the effect would be small. General variability in the data would have a greater influence

on exposure point concentrations, which is addressed by using USEPA's method for calculating the **UCL.** This method used to address nondetects has been accepted by **USEPA** Region IV in the past for similar federal facilities.

COMMENT:

2. Section 10.2.5, Page 10-9, Paragraph 3, Sentence 2.

The text indicates a source in "Determination of COCs by Risk-Based Screening **(USEPA 1994)".** However, the source of the screening values should be the most recent edition of the **USEPA** Region **3** Risk-Based Concentration Table.

RESPONSE:

The screening method used was described in the **1994** document referenced on page **10-9.** The most recent screening values were referenced on page 10-3. The text is being revised for clarity.

COMMENT:

3. Section 10.2.5, Page 10-10, Paragraph 3.

The text indicates that screening values on surrogate compounds were used if no screening values were available. However, it is not clear now surrogate compounds were selected nor how the surrogates were used in each specific site risk assessment. The text should give more specific information about the surrogates.

RESPONSE:

The text is being revised for clarity. **As** stated on page 10-10, surrogate compounds were selected based on structural, chemical, or toxicological similarities. Surrogate RBCs were used as screening values, if no screening value was available (Tables N-1, N-2, 0-1, and

0-2). If such a chemical was identified as a chemical of potential concern, hazard was estimated using the reference dose of the surrogate compounds, which are noted on Table P-1 (e.g., reference doses of pyrene and naphthalene were used as surrogates for phenanthrene and 2-methyl naphthalene.)

COMMENT:

4. Section 10.2.5, Page 10-11, Paragraph 1, Sentence **3.**

The text indicates that, after risk and hazard-based screening values were compared, CPSSs whose maximum detected concentrations exceeded corresponding background reference concentrations were retained as COPCs. However, the text does not state that this procedure applies only to inorganic compounds. The text should be revised accordingly.

RESPONSE:

The text in paragraph 1 on page 10-11 states that this procedure applies to naturally occurring compounds in accordance with RAGS Part **A,** Chapter 4.4.1. The text is being revised for clarity.

COMMENT:

5. Section 10.2.7, Page 10-16, Paragraph 0, Sentence 0.

The text indicates that applying the UCL is generally inappropriate with fewer than 10 samples. However, the text does not provide a basis for the statement that the UCL of the log normal mean can not be calculated for less than 10 samples. **A** justification for this statement should be added to the text.

RESPONSE:

The following text is from R.O. Gilbert's *Statistical Methods for Environmental Pollution Monitoring,* 1987: "Statistical bias is a discrepancy between the expected value of an

estimator and the population parameter being estimated. Some estimators are biased if n is small but become unbiased for n sufficiently large," and "using more than n = 10 is clearly desirable." Another similar statement is made in Texas' **Risk** Reduction Rules (" 335.553 (d) (2)), requiring 10 or more samples. The text will be revised to reflect these references.

COMMENT:

6. Section 10.2.7, Page 10-17, Paragraph 2.

The text addresses the EPC modification (use of FI) for soil where impacts were extremely limited in areal extent (hot spots). However, if "**hot** spots" are present, they should be dealt with separately and the risks calculated for the remainder of the exposure media. Since contaminants migrate in the groundwater and spread out with time, the presence of "hot spots" may be questionable. The issue of fractional exposure may need to be re-examined.

RESPONSE:

Please see the Response to General Comment 2. **Risk** estimates will be provided in the uncertainty section of the revised text to address FI/FC.

COMMENT:

7. Section 10.2.8, Page 10-28, Paragraph 2, Sentence **4.**

The Toxicity Assessment in the body of the report should contain the toxicity values (now in App. P), whereas the toxicity profiles could be moved to the Appendix.

RESPONSE:

USEPA's preference is noted. It should be noted that in previous risk assessments written for **NAS** Pensacola sites, USEPA Region IV preferred the toxicity profiles to be contained in the body of the report, and that the **profiles** also contain the toxicity values.

COMMENT:

8. Section 10.2.10, Page 10-54, Paragraph **4,** Sentence **4.**

The text states that local linearity was assumed to facilitate interpolation of the statistic for each **COPC.** However, there is a reference (Gilbert, **1987)** for the calculation of the H-statistic if a more accurate interpolation is needed. In fact, the appendix tables such as Table N-4 reference a cuboidal interpolation to estimate the H-statistic. The text should be revised accordingly.

RESPONSE:

Both statements are true. Linear interpolation was used to calculate the H-statistic. The term cuboidal interpolation is from Land's article in 1971, which Gilbert references.

COMMENT:

9. Section 10.2.10, Page 10-56, Paragraph 1 and 2.

The text addresses the use of FI/FC for the "hot spot". However, the use of FI/FC for "hot spots" is inappropriate. **As** a suggestion, if a "hot spot" id identified, then the data from the "hot spot" should be separated from the rest of the samples and the risk computed for both area. These paragraphs should be revised accordingly.

RESPONSE:

Please see the Response to General Comment **2.** Risk estimates will be provided in the uncertainty section of the revised text to address FI/FC.

COMMENT:

10. Section 10.3.1.3, Page 10-62, Paragraph 1.

The text indicates that the exposure soil duration for construction workers is relatively short. However, although the construction worker is limited in duration, the degree of exposure is higher. For example, the oral ingestion rate for a construction worker is 480 mg/day as opposed to 50 mg/day. The inhalation rate of particulates and volatiles for construction worker is also likely to be greater. Because of the high exposures to subsurface soils, construction workers should be considered as potentially exposed populations.

RESPONSE:

Most construction work requires less than one year. Consequently, subchronic assessment would be more appropriate, and typical site worker assumptions would overestimate exposure if applied to subsurface soil. Subsurface soil will be addressed in the revised Fate and Transport Section of the RI, which will include screening comparisons using typical site worker assumptions.

COMMENT:

11. Section 10.3.1.8, Page 10-79, Paragraph 1.

The text indicates that surface soil RGOs for carcinogens in Table 10-8 were based on the lifetime weighted average site resident and site worker, respectively. However, it is not clear if the FI/FC factor was applied to the calculation of the RGOs. If FI/FC factors were used, the RGOs may need to be re-calculated.

This comment also apples to Section 10.3.2.8.

RESPONSE:

RGOs were not calculated using FI/FC multipliers. The text is being revised for clarity.