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U S NAVY RESPONSES TO NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION COMMENTS ON REMEDIAL INVESTIGATION/RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION FOR SITE 1 AND SITE 41 MCRD PARRIS ISLAND SC

6/1/2001

NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION

NOAA Comments on Remedial Investigation (RI)/RCRA Facilities Investigation (RFI) for Site/SWMU 1 - Incinerator Landfill and SWMU 41 - Former Incinerator, Marine Corps Recruit Depot, Parris Island, South Carolina, Comments dated October 10, 2000

1a. **Comment:** The ecological risk assessment (ERA) is incomplete and inconsistent with EPA guidance. The first 2 steps of EPA's 8-Step ERA process was begun but not completed. A discrete Scientific-Management Decision Point for Step 2 (screening-level ERA) should be provided. This SMDP should summarize COPC identification (screening against maximum abiotic concentrations only) as well as other elements of the screening-level risk characterization. A clear ending to Step 2 will help focus subsequent activities under Step 3.

Response: Preliminary results of the screening level risk assessment, which consisted of Steps 1 and 2 of EPA's 8-step process, were presented to the partnering team in October 1998 and again in 1999. The partnering team concurred that a more thorough assessment was warranted, and that the Navy should proceed with the assessment; this decision represents the initial SMDP. Subsequently, a more thorough assessment is presented in Step 3A of the RI/RFI report. Comments, responses, and ultimate concurrence with the RI/RFI report will represent the next SMDP.

1b. **Comment:** Step 3, Problem Formulation, was begun but not completed. Notably absent are tables summarizing COPC refinement. When reporting COPC refinement, please provide media-specific tables with the following information.

a. Maximum, mean and range of site concentrations
b. Frequency of detection expressed not as a % but as # exceeded/total # of samples
c. Range of detection limits
d. Range of organic carbon content and grain size (sediment results)
e. EPA Region 4 screening value
f. Max. HQ based on maximum concentration and Region 4 screening value
g. Frequency of exceeding Region 4 screening value (again, not as a %)
h. Column(s) considering background concentrations (especially for inorganics)
i. Decision and rationale for including or excluding each analyte as a COPC. A brief text narrative may be required to clearly present each rationale.

Once the above tables have been prepared and distributed, conduct a Step 3-Problem Formulation meeting with the newly formed Parris Island ERA subgroup. Until that time, ERA conclusions and recommendations in the Executive Summary and Chapter 8.0 are premature

(e.g., recommendation to proceed directly to FS). Also, delete statement in the Executive Summary and Chapter 8.0 suggesting pesticides at Site 1 are not site-related until the data are rigorously evaluated for that possibility.

Response: Most of the requested information is presented in the RI report, although not in one table. However, as requested, TtNUS will summarize and submit the requested information in tables (added as Appendix F-7) to aid NOAA in completing their review of the RI report.

The ERA conclusions and recommendations presented in the executive summary and Section 8.0 are based on the belief that sufficient information is present to proceed to a Corrective Measures Study to address the primary site problems, i.e. the landfill wastes and contaminated sediments, similar to that conducted for Site 3.

The reference to pesticides not being related to site is a mis-statement. The correct statement is "Because of the common application of pesticides at the base, the pesticides may or may not be from site related waste disposal practices."

1c. **Comment:** The heavy emphasis on detailed food web modeling for ten different receptors are unnecessary for the Preliminary Effects Evaluation (§7.3) and Exposure Estimate (§7.4) and inconsistent with EPA regional and national guidance. Screening-level evaluations of higher trophic level risks should be confined to simple, conservative food web models. Likewise, inclusion of Measurement Endpoints (§7.2.5) at this early stage in the ERA is not consistent with EPA guidance.

Response: The risk assessment was performed in accordance with guidance in effect at the time, the approved work plan, and modifications agreed to during the partnering teams. The reviewer's comment reflects recently amended guidance from U.S. EPA Region IV (June 23, 2000) regarding the implementation of EPA's (1997) *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*. Under the amended guidance (EPA, 2000), most topics currently presented in Sections 7.3.2 through 7.5 (e.g., food chain modeling methodology) would instead be presented in Step 3 of the risk assessment process. However, the ecological risk assessment for Site 1 and SWMU 41 was conducted prior to dissemination of EPA's amended guidance. According to Lynn Wellman (2000) of U.S. EPA Region IV, reorganization of risk assessments already in process will not be required. The Navy will organize future ecological risk assessments as requested and this change will be discussed in the RI report.

2. **Comment:** Detection limits in sediment, surface water and ground water routinely exceed ecological screening values. For example, detection limits for mercury in ground water exceed the screening value by an order of magnitude. Sediment mercury detection limits routinely exceed the EPA screening value. PAH detection limits almost always exceed the sediment screening value. This may be related to creosote noted in the soil borings (p 3-3) and landfill debris (p 3-14). The Master WP (Table D-2) suggests SW 846-8310 would be used to achieve the necessary detection limits for PAHs. Was this method used? Detection limits for the bioaccumulative compound, PCP, are also very elevated in sediments (2-6 mg/kg) relative to the detection limit suggested in the Master WP (0.33 mg/kg). These routine violations of DQOs result in detection frequencies that are misleadingly low (Tables 7-4, 7-5, 7-8). Moreover, they underestimate the quantitative projections of ecological risks.

Response: The detection limits presented and the analytical methods used for this investigation represent the best reliable techniques available and were conducted in accordance with the approved work plan. For example, PAHs were analyzed in sediments using SW846-8310 - see Page D-103 as referenced.

The concern with the detection limits appears to focus on the use of the reported practical quantitation limits (PQLs) versus method detection limits (MDLs) (for organic compounds). The detection limits presented in the report for organics are the PQLs. The PQL represents concentrations at which most laboratories are able to routinely achieve and reliably report non detected values. For reporting purposes, the detection limit presented in the report is also adjusted for moisture content and dilutions (if employed). For sediment samples, which normally have a high moisture content, corrections factors of 1.5 to 5.0 are common. However offsetting these adjustments, the laboratory is contractually required to report detected values to the MDL, which represents the minimum concentration that the laboratory can detect a compound. The MDLs are normally a factor of 5 to 10 less than the PQL.

For example, the PQL for PCP is 0.8 mg/kg (the master work plan incorrectly reported the PQL as 0.33 mg/kg), therefore the resolution in the master work plan should have referenced best available technology. However, the laboratory method detection limits (MDLs) on a wet weight basis for PCPs in these samples ranged from 0.05 to 0.17 mg/kg (depending on the instrument)

This same discussion applies to mercury and the other organic results, including PAHs. MDLs for organic compounds are typically a factor of 5 to 10 times less than the reporting limit, and mercury MDLs for the study ranged from 0.031 to 0.13 ug/l for water and 0.006 to 0.02 mg/kg for soils/sediments. The MDLs are analyte and instrument specific and can vary over time. Also,

positive detections and reported concentrations are not very accurate in this range and a "J" qualifier is added (indicating an estimated value). Therefore, laboratories do not normally report to the MDL level.

For samples in which the chemical was not detected in any sample, there are two considerations. The first consideration is that the actual detection limit (MDL) for a chemical in a medium is less than the reliable detection limit presented in the report (PQL), generally by a factor of 5 to 10. Therefore, potential exceedances are not common. The second consideration is that the best reliable analytical methods were used in this study. To attempt to prove the absence of chemicals at concentrations below detectable limits is not feasible.

3a. **Comment:** More fully evaluate the ground water to surface water exposure pathway. Ground water is very shallow at this site (2'-3' BGS). It is likely that ground water is discharging at the surface water/sediment interface. This line of speculation is supported by elevated surface water/sediment concentrations that are spatially related to some elevated ground water analytes (e.g., see mercury and copper). The fate and transport section of this RI report should more fully explore this pathway.

Response: We concur, the groundwater to surface water scenario and risk are discussed in the report and further consideration of groundwater impacts on surface water and sediment will be evaluated in the feasibility study. This approach is a recommendation for the FS.

3b. **Comment:** Figures showing the direction of modeled ground water flow are normally provided in a RI report. Is there an explanation for their omission? Finally, the subject document does not report ground water results for upgradient or background monitoring wells. These analytical data would elucidate the ground water to surface water exposure pathway and facilitate the ecological risk assessment.

Response: The site hydrogeology is presented in Section 3.4 of the report and indicates that groundwater flows radially from the center of the site. Also, because of the monitoring wells are placed in a circle around the site, water level data cannot be used to generate a map as suggested.

Monitoring well PAI-MW04S can potentially be used as an upgradient/background well. Arsenic and zinc were detected in this well. If either of these chemicals become risk drivers, then PRG development in the FS will account for them.

4. Other Comments

4a. **Comment:** In the environment, PAHs exist and exert their toxicity as mixtures. It is for this reason that EPA Headquarters is developing ecological sediment guidelines based on the mixture of PAHs rather than individual compounds. To help simplify and clarify the Parris Island COPC screening/refinement process, consider using a "Total PAH" expression and use the EPA Region 4 screening value for Total PAHs.

Response: Concur. Sediment values for total PAHs were calculated and assessed (see Table 7-18, and Section 7.8.2). However, total PAHs were not shown in Table 7-5; this table will be revised.

4b. **Comment:** The cumulative toxicity discussion begun in §7.8.5 is excellent. Consider using ER-M quotients to help bolster this discussion. ER-M quotients permit one to quantitatively compare benthic toxicity risks among sample locations on an equal (i.e., normalized) basis. If mean quotients are calculated, consider guidance offered by Long et al. atwww.response.restoration.noaa.gov/cpr/sediment/SQGs.html (especially Table 4).

Response: Future ecological risk assessments at MCRD Parris Island will incorporate the use of ER-M quotients to the maximum possible extent.

4c. **Comment:** Sediment grain size/organic carbon information is inadequate. Grain size is reported for only 3 of the 14 sediment samples. These limited data indicate sediments sampled are approximately 60% sand+gravel (Table 4-6). This suggests sediment samples may not have been collected from depositional areas (per EPA Region 4 guidance). No grain size or organic carbon data is reported for the six reference/background samples. Table 4-6 is mistitled; delete reference to the Causeway Landfill.

Response: The number of samples collected for grain size and organic content analysis was in accordance with the approved work plan. The rationale for collecting this number of samples was to provide a general characterization of the sediments in the area. Since the area is a large flat tidal marsh, significant variations in these parameters would not be anticipated. The data collected was consistent with this expected uniformity. The work plan discussed the sampling methodology and indicated that in a given area, a sample would be biased toward depositional areas. Since the marsh surrounding Site 1 is largely uniform and flat, this bias was not a factor in selecting sample locations.

Also, as previously discussed, the predominant particle size for native materials in the area would lie in the sand particle range with some silts and clays. Therefore, the relatively high concentration of sand noted in the sediment matrix would be expected for this area and would be consistent with potential depositional areas for waste migration from the site.

Table 4-6 will be retitled.

4d. **Comment:** Section 7.2.4 indicates Ca, Mg, K, Na were deleted prior to screening. This is contrary to EPA Regional guidance. Include these analytes in the screen. Then evaluate their ecological risks during COPC refinement using the spatial distributions of analyte concentrations, background levels and known/suspected toxic levels.

Response: The essential elements Ca, Mg, K, and Na are normally excluded as ecological COPCs prior to the initial screening for the reasons provided in Section 7.2.4. The Navy is not aware of EPA Region IV guidance to the contrary, and the exclusion of these elements was not commented upon by EPA Region IV.

4e. **Comment:** The “tag” maps in Chapter 4 mislead the reader by omitting many exceedences of ecological screening values reported in Tables 7-4, 7-5, 7-6, 7-7, 7-8.

Response: The tags maps are presented in Section 4.0 - Nature and Extent of Contamination. Chemicals detected at concentrations below background are not contamination. Therefore, the alleged omission is simply a screen against background (inorganic only) contaminants. The ERA process is presented in Section 7.0 and follows appropriate guidance for ecological risk assessments. Specifically, background concentrations were not considered in Step 2 of the ERA process, but were considered (primarily for inorganics) in Step 3 of the ERA process.

4f. **Comment:** Include descriptions and a location map for the six background samples (Table 4-1).

Response: The location of the background sample locations is presented in Appendix A.

4g. **Comment:** The Theoretical Bioaccumulation Potential (TBP) model can be used to estimate bioaccumulation of neutral, non-polar compounds directly from sediment. However, this exposure model does not account for routes involving the ingestion of contaminated prey and/or chemicals that may biomagnify. It is inappropriate, therefore, to use TBP when these conditions may exist (e.g., §7.4.3.2).

Response: Concur; the use of the TBP model to predict concentrations of organochlorine pesticides in red drum was in error. Section 7.4.3.2 and Table 7-15 will be revised to show only predicted pesticide concentrations in mummichog tissue.

REFERENCES

EPA (U.S. Environmental Protection Agency). 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, June 5, Edison, New Jersey.

EPA (U.S. Environmental Protection Agency). 2000. Amended Guidance on Ecological RisK Assessment at Military Bases: Process Considerations, Timing of Activities, and Inclusion of Stakeholders. Memorandum from Ted. W. Simon, Region 4 EPA Office of Technical Services, Atlanta, Georgia, June 23.

Wellman, L.. (U.S. Environmental Protection Agency, Region 4, Waste Management Division, Atlanta, Georgia). 2000. Personal Communication with M.L. Whitten, April 13 (Tetra Tech NUS, Inc., Aiken, South Carolina).