N40003.AR.001014
PUERTO RICO NA
5090.3a

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

OCT - 4 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Christopher Penny
Navy Technical Representative
Installation Restoration Section (South)
Environmental Program Branch
Environmental Division,
Atlantic Division (LANTDIV), Code 182
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, VA 23511-2699

Re: Naval Station Roosevelt Roads - EPA I.D. Number PRD2170027203

1. Corrective Measures Study [Ecological] Investigation Report for SWMU #9,

2. Screening-Level Ecological Risk Assessment Problem Formulation and Additional Data Collection Work Plan for SWMUs 1 and 2, and

3. Screening-Level Ecological Risk Assessment Problem Formulation and Additional Data Collection Work Plan for SWMU 45.

Dear Mr. Penny:

The United States Environmental Protection Agency (EPA) Region 2 has completed its review of the Corrective Measures Study [Ecological] Investigation Report for SWMU #9, submitted on the Navy's behalf by Baker Environmental Inc's letter of July 2, 2001, and the Draft Screening-Level Ecological Risk Assessment Problem Formulation and Additional Data Collection Work Plans for SWMUs 1 and 2, and also for SWMU 45, both of which were submitted by Baker Environmental Inc's letter of August 10, 2001. The above documents were submitted pursuant to corrective action requirements of the 1994 RCRA Final Permit for Naval Station Roosevelt Roads. Following completion of the permit required RFI investigation activities, it was determined that possible ecological impacts needed further evaluation at the above three SWMUs, and the above documents are part of that evaluation.

EPA requested our contractor, Booz Allen and Hamilton (BAH), to review the above documents. Although the above documents were determined to be well organized and through, several limited issues need to be further addressed and/or clarified. These are discussed in the enclosed Technical Reviews dated August 9 and September 5, 2001, respectively.

Because of the voluminousness and complexity of the above documents, it is not necessary to re-submit revised copies of the entire documents, but only addendums to the original documents. Therefore, within 45 days of your receipt of this letter, please submit an addendum to the Corrective Measures Study [Ecological] Investigation Report for SWMU #9, addendums to the Screening-Level Ecological Risk Assessment Problem Formulation for SWMUs 1 and 2, and an addendum for SWMU 45, addressing comments given in the two enclosed Technical Reviews. Furthermore, the Additional Data Collection Work Plans for SWMUs 1 and 2, and for SWMU #45 (Appendix B of both of the August 10, 2001 submittals) are approved as submitted.

If you have any questions, please have them contact Mr. Tim Gordon of my staff, at (212) 637-4167.

Sincerely yours,

Michael Poetzsch, Acting Chief
Caribbean Section
RCRA Programs Branch

Enclosures (2)

cc: Ms. Madeline Rivera, Public Works Department, Naval Station Roosevelt Roads, w encl.
Ms. Aissa Colon, P.R. Environmental Quality Board, w encl.
Kevin Cloe, Environmental Division, Atlantic Division (LANTDIV), Naval Facilities Engineering Command, w. encl.
Ms. Kathy Rogovin, Booz Allen & Hamilton, w/o encl.
Mr. Mark Kimes, Baker Environmental, w encl.
Mr. John Tomik, CH2MHill, w encl.

Encl. 1

TECHNICAL REVIEW OF THE JULY 2, 2001 DRAFT CORRECTIVE MEASURES STUDY INVESTIGATION REPORT FOR SWMU 9

NAVAL STATION ROOSEVELT ROADS CEIBA, PUERTO RICO

REPA2-0203-030
August 9, 2001

I. GENERAL COMMENTS

1. In general, the July 2, 2001 Draft Corrective Measures Study (CMS) Investigation Report for SWMU 9 (CMS Report) provides acceptable information to support the ecological risk assessment (ERA). Naval Station Roosevelt Roads (NSRR) should incorporate the recommendations presented in the specific comments below in order to finalize the report.

2. Total petroleum hydrocarbon (TPH) data for surface soil have been collected but are not used in assessing risks to soil invertebrates and plants. Surface soil TPH data should be included as an additional line of evidence in the assessment of terrestrial ecological risks to soil organisms. Although the TPH levels reported for site surface soils are very low, EPA requests their inclusion because: (1) TPH was detected in surface soil; (2) risks could not be assessed for all polycyclic aromatic hydrocarbons (PAH) analytes (e.g., missing benchmarks); (3) TPH benchmarks are available for soil invertebrates and plants (see references provided below); and (4) TPH quantifies the complex mixture of petroleum that is not quantifiable by specific analytes. Inclusion of this information will provide additional confidence in the conclusions regarding terrestrial risks from petroleum hydrocarbons.

II. SPECIFIC COMMENTS

Section 2.4 Surface Water and Sediment Background Investigation

1. Page 2-5 provides justification for the selection of surface water and sediment background locations. In addition to the justification provided, the following is requested to provide additional support for the selected background locations: (1) a topographic map that shows the fuel farm is downgradient of the road; and (2) a brief summary of groundwater regime that shows fuel farm groundwater is not impacted and/or does not flow towards the background locations. These aspects have been noted in previous discussions between NSRR and EPA. EPA requests this information because it is critical that the CMS Report demonstrate that the selected background locations are appropriate. Background data are used to eliminate contaminants of potential concern (COPC) in the baseline ERA, and thus are key components of the ERA for SWMU 9.

Section 3.1.2 SWMU 9 Background

2. Page 3-2 states that six analytical results for antimony were rejected and not used in the background analysis. Because of the importance of background data in the ERA for Areas A, B, and C, additional clarification of the rationale for data rejection should be provided.

Section 4.0 Analytical Results

3. Table 4-7, Summary of Organics Detections in Sediment, lists estimated and non-detected values for semivolatiles in sediment, and shows that detection limits range from 31 to 1,500 ug/kg (48 fold variation). Given the importance of the detection limit evaluation in the ERA, the high variability in detection limits for PAHs should be clarified in the text of the report. The text should include a discussion of specific screening benchmarks (e.g., detection limits in sample 9SW/SD19 exceed screening benchmarks).

Section 4.2.1 Sediments - Areas A and B

4. Page 4-3 discusses solvents that occur in pesticides, herbicides, and insecticides. The text should clarify if the discussed pesticides are currently used or banned organochlorine compounds historically used at the site. The cited references for these compounds (Spectrum Laboratories, as referenced in Section 7.0) only provide a chemical abstract service (CAS) number and do not indicate the name of the compounds. Clarification of the pesticides discussed in Section 4.2.1 is necessary for the reader to understand the types of materials used and the associated levels of concern.

Section 5.2.2 Identification of Chemicals Evaluated for Ecological Risks

5. Page 5-10 states that a discussion of uncertainties associated with the exclusion of pesticides from the monitoring program will be provided in Section 5.8. The report, however, does not contain a Section 5.8, nor is this information presented elsewhere in the document. The CMS Report should be revised to include this information.

Section 5.3.1 Preliminary Conceptual Model

6. Figure 5-4 presents the Preliminary Conceptual Site Model (CSM), and indicates that the direct contact exposure pathway from sediment to benthic invertebrates would only be qualitatively evaluated. The figure should be revised to show that this pathway was quantitatively evaluated (e.g., screening sediment concentrations against sediment benchmarks). In contrast, fish exposure to sediment is shown as being quantitatively evaluated, although this pathway was not considered. In addition, the CSM depicts mammals as being quantitatively evaluated, but mammals were not included in the ERA. The CSM should be revised to reflect the pathways and receptors evaluated in the CMS Report.

Section 5.3.1.3 Endpoints and Risk Hypothesis

7. Page 5-14 indicates that assessment endpoints were selected based only on aquatic receptor groups. Terrestrial receptors (soil invertebrates, plants) should also be noted in the text because these communities were included in the ERA, and are included in Table 5-6, Preliminary Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints.

Section 5.6.2.1 Area B Surface Soil

8. Page 5-36 discusses Area B surface soil risks but does not discuss TPH. Furthermore, risks are not screened for TPH in Table 5-23. TPH was detected in Area B surface soil (Table 4-3) and toxicity benchmarks are available (e.g., Dorn et al., 1998; Saterbak et al., 1999). Risks from TPH in site soil should be screened (see General Comment 2). One concern is that there is only one sample in proximity to the former waste pit (Figure 2-4). The evaluation of soil risks should include a discussion of whether potential ecological exposures have been adequately characterized in this area. The weight of evidence assessment for petroleum risks in surface soil should include a discussion based on TPH measurements, historical operations, spatial extent of potential surface petroleum contamination in the waste pit, and the potential for any downgradient contamination.

Section 5.7.1.2.3 Frequency of Detection

9. Page 5-51 states that cyanide was detected in a single surface water sample in Area A/B and thus should not pose a risk to aquatic organisms. The discussion fails to note that the marine ambient water quality criterion (AWQC) is 1 ug/kg for cyanide, resulting in a hazard quotient (HQ) of 61 (USEPA, 1999). Given the high HQ exceedence of a marine AWQC, and a 25% detection frequency (1 of 4 samples), additional sampling is merited.

Section 5.7.1.3.2 Bioavailability of Ecological COPCs

10. Page 5-53 indicates that sediment benchmarks for organics were derived using the equilibrium partitioning theory (EqP) for the bioavailability evaluation in the refined risk assessment. The derived benchmarks appear to be extremely high relative to other sediment toxicity values, even exceeding effects range medium levels (ER-M). For example, NOAA (1999) lists marine sediment benchmarks for chrysene of 0.1 to 2.8 mg/kg. In contrast, Table 5-45 lists a chrysene benchmark of 256 mg/kg. Also, the EqP-derived benzo(a)anthracene benchmark was 770 mg/kg, compared to NOAA (1999) benchmarks ranging from 0.7 to 1.6 mg/kg. The EqP benchmarks appear to be exceedingly high, even accounting for organic carbon in site sediment. Sediment risks of PAHs in the refined risk assessment should be reevaluated using standard benchmarks, unless the derived benchmarks can be shown to be consistent with consensus based benchmarks (e.g., McDonald et al., 2000) or other standard values (NOAA, 1999).

Section 5.7.4 Ecological Risk Assessment Conclusions

11. Page 5-72 presents ERA conclusions that the only chemicals posing ecological risks are lead and zinc in Area B surface soil, and lead in Area A/B sediment. The risk conclusions should

be re-evaluated following the reassessment of risks from cyanide in Area A/B surface water, and PAHs in sediment.

12. Although uncertainties in the screening level risk calculation are discussed in Section 5.6, uncertainties in the refined risk assessment (Section 5.7) are not discussed. The refined risk assessment should include a discussion of uncertainties, including how the risk calculations address special status species that may use site habitats in proximity to Areas A, B, and C.

Section 6.0 Conclusions and Recommendations

13. Page 6-1 summarizes the conclusions and recommendations regarding the ERA. The risk conclusions should be reevaluated following the additional sampling for cyanide in Area A/B surface water, the additional evaluation of existing TPH data in surface soil, and the reevaluation of risks from PAHs in sediment.

References

Dorn, P. B., T. E. Vipond, J. P. Salanitro, and H. L. Wisniewski. 1998. *Assessment of the Acute Toxicity of Crude Oils in Soils Using Earthworms, Microtox^R, and Plants*. Chemosphere 37:845-860.

MacDonald D. D., C. G. Ingersoll, and T. Berger. 2000. *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*. Arch. Environ. Contam. Toxicol. 39:20-31.

NOAA. 1999. *Screening Quick Reference Tables*. http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html

Sample, B. E., D. M. Opresko, and G. W. Suter II. 1996. *Toxicological Benchmarks for Wildlife: 1996 Revision*. Oak Ridge National Laboratory. ES/ER/TM-86/R3. http://www.hsrd.ornl.gov/ecorisk/reports.html

Saterbak, A., R. J. Toy, D. C. L Wong, B. J. McMain, M. P. Williams, P. B. Dorn, L. P. Brzuzy, E. Y. Chai, and J. P. Salanitro. 1999. *Ecotoxicological and Analytical Assessment of Hydrocarbon-Contaminated Soils and Application to Ecological Risk Assessment*. Environ. Toxicol. Chem. 18:1591-1607.

USEPA. 1999. *National Recommended Water Quality Criteria-Correction*. EPA 822-Z-99-001. April 1999.

Enclosure 2

TECHNICAL REVIEW OF THE DRAFT SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT PROBLEM FORMULATION (STEP 1) AND EXPOSURE ESTIMATE FOR SWMU 45, AND DRAFT SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT PROBLEM FORMULATION (STEP 1) AND EXPOSURE ESTIMATE FOR SWMUs 1 AND 2

NAVAL STATION ROOSEVELT ROADS
CEIBA, PUERTO RICO

REPA2-0203-031
September 5, 2001

I. GENERAL COMMENTS

1. EPA has reviewed the Naval Station Roosevelt Roads (NSRR) August 10, 2001 Draft Screening-Level Ecological Risk Assessment Problem Formulation (Step 1) and Exposure Estimate for SWMU 45, and the Draft Screening-Level Ecological Risk Assessment Problem Formulation (Step 1) and Exposure Estimate for SWMUs 1 and 2, as well as the revised tables to these documents, subsequently submitted to EPA on August 30, 2001. These interim ecological risk assessment (ERA) reports and work plans are acceptable, contingent on incorporation of the revisions identified in the specific comments below.

II SPECIFIC COMMENTS

DRAFT SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT PROBLEM FORMULATION (STEP 1) AND EXPOSURE ESTIMATE FOR SWMU 45

4.1.2 Exposure Pathways and Routes, page 4-2

1. Figure 4-1 presents the conceptual site model (CSM), but does not show an uptake/bioaccumulation pathway from sediment to biota. The sediment to biota uptake pathway is discussed in Section 4.1.2 and shown in Figure 3-1 of the July 2000 Revised Final II Corrective Measures Study Work Plan. The CSM should be revised to show the sediment to biota uptake pathway as complete.

5.1 Media-Specific Screening Values, page 5-1

2. Tables 5-1, 5-2, and 5-3 present soil, sediment, and surface water screening values, and generally contain a comprehensive list of benchmarks. To further reduce the number of chemicals with no screening values, additional sources of screening values should be considered, as well as the use of values for surrogate chemicals (e.g., use the screening value for a chemical with a similar chemical structure). A potential source of additional

screening values is EPA (1999) (see references below). Additionally, Suter (1996) contains surface water benchmarks for freshwater biota that should be considered. Although the applicability of these freshwater values to marine organisms is uncertain, using these values would likely create less uncertainty in the ERA than if no screening value is used.

6.2 Selection of Ecological Receptors, page 6-3

3. Page 6-3 and Table 6-5 list the double-crested cormorant, rather than the great blue heron listed in the July 2000 SWMU 45 Work Plan. Although cormorants are an acceptable receptor species, risks may be similar for kingfisher because both species primarily consume trophic level 3 fish (Table 6-6). Rather than having two receptors that consume fish, a broader assessment of risks would be accomplished with a receptor that primarily consumes benthic invertebrates (e.g., the spotted sandpiper that is assessed in the SWMUs 1 and 2 ERA). If shorebirds or other benthic invertebrate consumers are unlikely to feed in the intertidal environment of Puerca Bay, then please include both the kingfisher (consumes some invertebrates; Table 6-6) and cormorant.

6.3.1 Exposure Point Concentrations, page 6-4

4. Table 6-2 lists bioaccumulation factors (BAFs) for soil to small mammals. The majority of the values in this table are listed as "see text." Page 6-7 presents a good explanation of the rationale for using a default assumption of 1 for the BAF. An acceptable alternative procedure would be to use the BAFs presented in EPA (1999). Rather than listing "see text," Table 6-2 should be completed using the default BAF value or alternative values.

5. Table 6-3 presents sediment BAFs and shows that a default value of 1 was used in the absence of chemical-specific information. EPA (2000) is a useful source of biota to sediment uptake factors, and may reduce the need to use a default value of 1 for many chemicals.

6. Page 6-7 indicates that sediment to aquatic plant BAFs will be assumed to be equal to the soil to plant BAFs shown in Table 6-1. The applicability of the terrestrial plant BAFs to aquatic plants is unknown, and thus would represent a substantial uncertainty in the risk assessment. Because of the importance of protecting individual endangered manatee, a more conservative approach is warranted. A default BAF of 1 for aquatic plants is recommended, unless the value in Table 6-1 is greater than 1. Additionally, the ERA report should discuss any available literature information on the bioaccumulation of contaminants from sediment to sea grass or similar species. Alternatively, samples of sea grass from potential manatee feeding areas (e.g., co-located with planned sediment sampling) could be collected to determine site-specific BAFs and dietary contaminant levels. It is possible that BAFs determined from samples from Puerca Bay could be applied to other site locations, potentially reducing uncertainties and sampling requirements.

6.3.3 Ingestion-Based Screening Values, page 6-11

7. Table 6-7 and 6-8 present toxicity reference values (TRVs) for birds and mammals, and contain numerous missing values. Additional reference sources should be considered in order to limit the number of chemicals without benchmarks. Two useful sources include EPA (1999) and Schafer et al. (1983).

DRAFT SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT PROBLEM FORMULATION (STEP 1) AND EXPOSURE ESTIMATE FOR SWMUs 1 AND 2

4.1.2 Exposure Pathways and Routes, page 4-2

8. Figures 4-1 and 4-2 presents the CSMs for these SWMUs, but do not show an uptake/bioaccumulation pathway from sediment to biota. See Specific Comment 1.

4.1.3 Endpoints and Risk Hypotheses, page 4-3

9. Table 4-1 contains typographical errors in the endpoint and risk hypothesis for aquatic mammals. EPA understands that the aquatic mammal endpoint is for the manatee.

5.1 Media-Specific Screening Values, page 5-1

10. See Specific Comment 2.

6.3.1 Exposure Point Concentrations, page 6-6

11. See Specific Comment 4.

12. See Specific Comment 5.

13. Page 6-8 indicates that sediment to aquatic plant BAFs will be assumed to be equal to the soil to plant BAFs shown in Table 6-1. See Specific Comment 6.

6.3.3 Ingestion-Based Screening Values

14. See Specific Comment 7.

References

EPA 1999. *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities*. Peer Review Draft. August 1999. EPA 530-D-99-001A.

http://www.epa.gov/earth1r6/6pd/rcra_c/protocol/slerap.htm

EPA 2000. *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment. Status and Needs*. February 2000. EPA-823-R-00-001. http://www.epa.gov/ost/cs/biotesting/

Schafer, E. W., Bowles, W. A., and Hurlbut, J. 1983. *The Acute Oral Toxicity, Repellency, and Hazard Potential of 998 Chemicals to One or More Species of Wild and Domestic Birds.* Arch. Environ. Contamin. Toxicol. 12:335-382.

Suter, G. W. II. 1996. *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Freshwater Biota.* Environ. Toxicol. Chem. 15:1232-1241.