



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

FEB 13 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Mark E. Davidson
US Navy
BRAC PMO SE
P.O. Box 190010
North Charleston, SC 29419-9010

Re: Naval Activity Puerto Rico (NAPR), formerly Naval Station Roosevelt Roads,
EPA I.D. Number PRD2170027203,

- 1) Work Plan to Conduct Phase I RCRA Facility Investigation (RFI) at SWMU 9 Area B, Tank 214 Area, dated January 17, 2007;
- 2) Draft RFI Report for SWMU 14 (former fire training "pit"), dated December 18, 2006;
- 3) SWMUs 1 and 2 - Steps 3b and 4 of the Baseline Ecological Risk Assessment Report;
- 4) Phase II Closure Sampling Report for DRMO Buildings 2009, and 2009 A-D, dated January 2007; and
- 5) SWMU 3 - Landfill Closure and Post-Closure Plan (Revision 1), dated August 2005.

Dear Mr. Davidson:

This letter is addressed to you as the Navy's designated project coordinator pursuant to the January 29, 2007 RCRA Administrative Order on Consent ("the Consent Order") between the United States Environmental Protection Agency (EPA) and the U.S. Navy (the Navy). EPA Region 2 has completed its reviews of the above documents, which were submitted on behalf of the Navy, pursuant to the requirements of the Consent Order. Based upon our reviews, EPA has determined the following:

Phase I RFI Work Plan for newly discovered petroleum release at SWMU 9, Area B, Tank 214 Area

The Phase I RFI Work Plan dated January 17, 2007 (the Work Plan), as modified on behalf of the Navy by Mr. Mark Kimes' (of Baker Environmental) letter of January 29, 2007 is acceptable. Also, the Responses to Comments submitted on January 17, 2007 to address EPA's previous

comments are acceptable. Therefore, within 45 days of your receipt of this letter, please commence implementation of the Work Plan pursuant to the schedule given in Figure 5-1 of the Work Plan. Please submit the draft Final Phase I RFI Report for these newly discovered petroleum releases at SWMU 9, Area B, Tank 214 Area no later than August 10, 2007.

Draft RFI Report for SWMU 14 (former fire training "pit")

Based upon our review and a review by EPA Region 2's contractor, Booz Allen Hamilton (Booz Allen), EPA has determined that the December 18, 2006 Draft RFI Report for SWMU 14 is not fully acceptable. Several items in the Draft Report that are not fully acceptable and need revision are discussed in the enclosed Technical Review. Within 35 days of your receipt of this letter, please submit an addendum to the work plan or a revised work plan, which addresses all comments given above and in the enclosed technical review.

SWMUs 1 and 2 - Steps 3b and 4 of the Baseline Ecological Risk Assessment Report

EPA and our contractor, Booz Allen, have completed a technical review of the January 10, 2007, Final Steps 3b and 4 of the Baseline Ecological Risk Assessment (BERA) for Solid Waste Management Units (SWMUs) 1 and 2, and the January 10, 2007 Response to EPA's Comments on the September 29, 2006 Draft Steps 3b and 4 of the BERA.

Our review indicates that the Responses are acceptable and the Final Steps 3b and 4 of the BERA has been adequately revised to incorporate the responses. Therefore, the January 10, 2007 Final Steps 3b and 4 of the BERA Report is approved. Please now proceed to implement the remaining portions of the ecological risk assessment work for SWMUs 1 and 2, pursuant to the schedule given in Figure 6-1 of the Final Steps 3b and 4 Report.

Phase II Closure Sampling Report for DRMO Buildings 2009, and 2009 A-D

The December 2006 Phase II Closure Sampling Report and Responses to EPA's comments on previous versions of that report are acceptable. To complete clean closure of Buildings 2009 and 2009 A-D, which were formerly permitted as hazardous waste storage units under the 1994 RCRA operating permit for former Naval Station Roosevelt Roads, please now submit a Risk-Based Closure Report(s), implemented under the January 2006 Site Specific Risk Assessment Work Plan, that incorporates the results of the December 2006 Phase II Closure Sampling Report, and the prior closure sampling results for Buildings 2009 and 2009 A-D. In addition, at that same time, please submit the Closure Certification(s) required under 40 CFR § 264.115 for the former DRMO Buildings 2009 and 2009 A-D. Such certification must indicate that closure has met the applicable requirements of the approved Closure Plan, all applicable requirements of 40 CFR Part 264 Subparts G and I, and the requirements of paragraph 25 (Completion of Closure) of the January 29, 2007 RCRA Consent Order. As discussed with Mr. Pedro Ruiz of NAPR and Mr. Russ Bowen of CH2MHill, the Navy's contractor for this project, the above documents are to be submitted by March 19, 2007.

SWMU 3 - Landfill Closure and Post-Closure Plan

As discussed with Navy representatives during the February 7, 2007 BRAC Clean-up Team (BCT) meetings in San Juan, PR, within 45 days of your receipt of this letter, please submit a letter to EPA indicating that in regards to Area 1 of the landfill (Inactive Areas), the requirements of the approved Landfill Closure and Post-Closure Plan (Revision 1), dated August 2005, including installation of "a final cover system of 18 inches of soil, compacted to 1 X 10 minus 5 cm/sec and overlain with 6 inches of cover material capable of supporting native plant growth...." (refer to Section 2.1 of the Aug 2005 document), are to be implemented at some point in the future, and not as part of the closure activities now underway at SWMU 3. It is EPA's understanding that the closure activities underway only address Areas 2, 3, and 4 (the Active portions) of the Landfill.

Also, the Navy's letter should include a discussion of any evaluations performed to determine whether or not installation of a methane collection system (pursuant to the Clean Air Act) is required as part of the landfill closure. If none is required, please include in your letter a brief discussion of why no methane collection system is required as part of the closure.

Please submit the letter, as discussed above.

In addition, for all of the areas discussed above, at least one week prior to commencement of any field work involving sample collection or other activities, please advise both Mr. Manuel Vargas of the PREQB (either via phone (787-767-8181 ext. 3583) or Email) and myself, as PREQB may provide field oversight for portions of that field work.

If you have any questions, please telephone me at (212) 637- 4167.

Sincerely yours,



Timothy R. Gordon
Remedial Project Manager
Caribbean Section
RCRA Programs Branch

Enclosure (1)

cc: Ms. Yarissa Martinez, P.R. Environmental Quality Board, w/encl.
Mr. Julio I. Rodriguez Colon, P.R. Environmental Quality Board, w/encl.
Mr. Manuel Vargas, PREQB, w/o encl.
Mr. Pedro Ruiz, Naval Activity Puerto Rico, w/encl.
Mr. Dave Criswell, US Navy, BRAC PMO, w/o encl.

Mr. Mark Kimes, Baker Environmental, w/encl.
Mr. Russ Bowen, CH2MHill, w/o encl.
Mr. Felix Lopez, USF&WS, w/o encl.
Ms. Jennifer Nystrom, Booz Allen & Hamilton, w/o encl.

TECHNICAL REVIEW

DRAFT RCRA FACILITY INVESTIGATION REPORT SWMU 14

DECEMBER 18, 2006

NAVAL ACTIVITY PUERTO RICO CEIBA, PUERTO RICO

January 18, 2007
REPA3-2203-107

Booz Allen Hamilton has conducted a technical review of the Draft RCRA Facility Investigation (RFI) Report for the fire training pit area at the Naval Activity Puerto Rico (NAPR) facility in Ceiba, Puerto Rico. This area, designated as Solid Waste Management Unit (SWMU) 14, is located adjacent to the Naval Station Roosevelt Roads (NSRR) airfield and currently consists of a lined pit used for fire training activities. Two unlined pits previously located in this area, identified as the "old fire training pit" and the "temporary fire training pit", were used for fire training activities between the 1960s and 1983. Visibly contaminated soils were removed from the two old pits during construction of the new, lined pit in the same location in 1983.

An estimated 120,000 gallons of waste solvent, fuel, and oil was burned at the fire training pits during the units' operational period. Phase I RFI activities in 1996 detected semi-volatile organic compounds (SVOCs) in surface soil above industrial risk-based concentrations. Based on the Draft Interim Decision Document from November 2000, additional characterization of contamination at SWMU 14 was postponed until the area was no longer needed for training operations. Fire training activities were suspended on March 31, 2004, and further investigation was initiated. Field work for this effort was conducted in March 2006.

The objectives of this RFI were: (1) to determine if any environmental contamination associated with past operations was present at this SWMU, (2) to assess and document potential human health risks posed by the SWMU, and (3) to assess and document potential ecological risks posed by the SWMU. Based on the completed investigation, NAPR has concluded that SWMU 14 does, indeed, present potential human health and ecological risks. Furthermore, NAPR has recommended additional investigation of soil, and possibly surface water and sediment, associated with the former drainage ditch to close data gaps for the ecological risk assessment.

It should be noted that evaluation of potential corrective measures options was not included in the scope of this effort, as defined by the approved Final RFI Work Plan (WP) dated November 11, 2005. Thus, it is expected that NAPR will provide further documentation on SWMU 14 including a work plan for follow-on sampling, reporting of the results and further ecological risk assessment, and evaluation of potential corrective measures options to address

identified human health and ecological risks. Nevertheless, staying within the stated scope of the draft RFI Report, several issues of concern were identified during our review. These items are detailed in the comments below.

I. GENERAL COMMENTS

1. Although Section 6.3.1 indicates that inhalation of volatile emissions emanating from groundwater will be evaluated as an exposure pathway for the future young child resident receptor in the human health risk assessment (HHRA), and appropriate exposure parameters are outlined in Table 6-4, these calculations were not performed for the young child resident receptor. NAPR should perform these calculations and insert a summary of the results into the revised HHRA, as appropriate. Alternatively, NAPR should discuss why quantitative evaluation of this pathway was not necessary, and remove references to it from other sections, as appropriate.
2. While it is understood that no buildings are currently located within SWMU 14, the HHRA states that, "in the future scenario, although land use is uncertain, it is assumed that residential development of the site could occur" (page 6-7). Appendix H, Table 1, Selection of Exposure Pathways, indicates that the vapor migration to indoor air exposure pathway is discussed qualitatively for the adult resident and construction worker receptors; however, relevant discussion could not be located in Section 6.3 or elsewhere in the document. Since volatile organic compound (VOC) contamination is present in groundwater (unknown depth interval[s]), it is unclear why NAPR evaluated inhalation of volatile emissions emanating from groundwater (i.e., while showering or bathing) for future residents quantitatively, but did not evaluate risks posed by exposure to indoor air impacted by vapor intrusion, either quantitatively or qualitatively. NAPR should revise the HHRA to include either a qualitative or quantitative discussion of vapor intrusion for future receptors, as appropriate, following EPA's November 2002 *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*.

II. SPECIFIC COMMENTS

Section 4.1, Soil Boring Advancement and Temporary Well Installation, Page 4-1

1. The second paragraph in this section indicates that two temporary wells were installed in the original/current fire training pit area (FTPA) at locations 14SB01 and 14SB02). The third paragraph in this section indicates that a third temporary well was installed at the center of the temporary FTPA. At first glance, the placement of only two temporary wells in the original/current FTPA appears to contradict the scope of work outlined in the approved RFI WP for this SWMU. Section 3.0 of the WP indicated that three temporary wells would be installed at the original/current FTPA (along with another one at the temporary FTPA). However, discrepancies in the final WP (specifically, between Section 3.0, Section 3.2, Table 3-1, and Figure 3-1) call into question the required number of temporary wells. Thus, the implemented scope of RFI work at this SWMU was, presumably, based on NAPR's interpretation of the WP, and not necessarily EPA's

interpretation. Nevertheless, despite these inconsistencies, data obtained from the three temporary wells was sufficient to confirm that groundwater contamination is a significant human health risk driver for certain exposure pathways. Thus, it is likely that groundwater will need to be further addressed as part of corrective measures for SWMU 14.

Section 4.3.3, Field Blanks, Page 4-3

2. As stated in Section 3.4.3 of the approved RFI WP, NAPR anticipated using and collecting field blanks from three water sources during this investigation (i.e., lab-grade deionized water, NAPR potable water, and store-bought distilled water). According to this section of the RFI Report, only two field blanks were collected (deionized water and NAPR potable water). The RFI Report should be revised to confirm that no distilled water was used during the SWMU 14 field effort, or explain why the associated field blank was not collected as scoped.

Section 5.3, Subsurface Soils, Page 5-3

3. The last sentence in this section suggests that lead exceeded its NAPR background value in only a few samples and these exceedences, "are likely dataset anomalies rather than an indication of substantial metals contamination". However, lead concentrations were reported above the established site-specific background level in five of the fourteen subsurface soil samples. Because lead concentrations also exceeded background levels in the surface soil samples, it seems more likely that these results indicate some lead contamination in surface and subsurface soil. Revise the RFI Report to address this issue in greater detail and provide justification for why lead detections were considered to be anomalies rather than indications of actual contamination.

Section 5.5, 2006 Laboratory Data Validation Summary, Page 5-4

4. As currently written, this section is too general to provide the end-user with an understanding of the limitations placed on specific data and the impact, if any, on attaining project objectives. The data validation summary should be rewritten to describe the usability of the data for specific samples and constituents. Vague statements, such as, "...some compounds were qualified as estimated," or "Qualifications were added to the data," should be replaced with more specific statements regarding the usability of the data as indicated by the data validation. The revised section should identify all data that were rejected by media, sample name, and constituent of concern; describe the reason for the rejection; and assess how the rejection affects attainment of project objectives. Specific data that were qualified as estimated also should be identified, the magnitude and direction of bias described, and impact on project objectives evaluated. The focus of the section should be to concisely alert end-users of limitations on the usability of the data, rather than reiterate information regarding specific quality control (QC) failures from the data validation reports.

Section 6.2.2.2, Selection of COPCs, Surface Soil, Page 6-4

5. The second paragraph incorrectly notes that 2-butanone has no current screening criteria available; this should be changed to 2-hexanone. Revise the HHRA to correct this error.

Section 6.3.1, Potential Human Receptors, Future On-Site Adult and Child (Ages 1-6 Years) Receptors, Page 6-8

6. The fourth bullet lists "incidental ingestion of groundwater" as an exposure pathway that was evaluated quantitatively for the future residential adult and child receptors in the HHRA. This should be modified to indicate ingestion of groundwater as a potable source, to avoid confusion and ensure consistency with the description of this exposure pathway on page 6-7 and Figure 6-1, Conceptual Site Model.

Section 6.3.5, Exposure Input Parameters, Page 6-10

7. While the exposure input parameters outlined in this section and listed in Table 6-4 appear appropriate, NAPR does not provide rationale for most values that are based on professional judgment. For example, NAPR points out that using an exposure time (ET) of 24 hours for future residential receptors is conservative. However, all other exposure input parameters that are based on professional judgment require a brief explanation to justify the selection and improve transparency of the HHRA. This section should be revised accordingly.

Section 6.4.3, Dermal Absorption Efficiency, Page 6-15

8. This section provides a detailed discussion of how dermal absorption factors were used to adjust reference doses (RfDs) and cancer slope factors (CSFs). The discussion implies that oral to dermal adjustment factors less than 100% were used in some cases. However, based on the information provided in Table 6-5, the oral to dermal adjustment factors for all chemicals of potential concern (COPC) are listed as 100%. It is unclear why Section 6.4.3 would provide such a detailed justification for using oral to dermal adjustment factors less than 100% if 100% was used for all COPCs. Revise the HHRA to clarify that oral to dermal adjustment factors of 100% were, in fact, used for all COPCs listed in Table 6-5.

Section 6.5.3, Potential Human Health Effects, Page 6-17

9. Adult and adolescent trespassers were omitted from the discussion in the first paragraph in this section. This paragraph should be revised to indicate that site risks were estimated for these receptors, even if no unacceptable risks were calculated.

Section 6.5.3.2, Future Adult and Young Child Residents, Page 6-18

10. The third paragraph of this section states that, "ingestion and inhalation of groundwater COPCs contributed primarily to the groundwater HI [hazard index] (10.6) for the residential child." This statement is incorrect, however, as risks to the future young child resident due to inhalation of groundwater COPCs were not estimated (see General Comment No. 1). Thus, the groundwater HI can be attributed solely to ingestion and dermal exposures. Depending on the resolution to General Comment No. 1, this statement should be revised or retained as appropriate.

Section 6.8, HHRA References, Page 6-24

11. The reference date given for the EPA Region 3 Risk-Based Concentration (RBC) Table is April 2006; however, the RBC Table was updated more recently, in October 2006. NAPR should ensure that the most up-to-date RBC values have been used in the HHRA to screen site COPCs, and update this reference in the revised HHRA.
12. The reference date given for EPA's Integrated Risk Information System (IRIS) is 2004. Given that IRIS is updated several times a year, it is unclear why NAPR did not reference the date as 2006. Based on a cursory review of the recently updated data provided in IRIS, it does not appear that new toxicity data have been added for any of the site COPCs since 2004; however, NAPR should verify this observation and update the reference to 2006 (or 2007), as necessary.

Section 7.1.3.2, Birds, Page 7-4

13. The discussion in the last paragraph on page 7-4 should be revised to indicate whether suitable foraging habitat exists at SWMU 14 for the yellow-shouldered blackbird (*Agelaius xanthomus*). If so, the screening-level ecological risk assessment (SERA) should be revised to discuss how risks to this species can be evaluated. For example, if the American robin (*Turdus migratorius*) can be used appropriately as a surrogate receptor to evaluate risks to the blackbird, this should be noted in relevant sections of the SERA.

Section 7.4.1, Media-Specific Screening Values, Page 7-13

14. This section indicates that, when more than one threshold was available from the specified sources (i.e., Efroymson et al. 1997a and b, USEPA 2005a, both as cited in the RFI), the lowest value was selected as the screening value. Note that, rather than using the lowest value from these sources, it is recommended that EPA Ecological Soil Screening Levels (Eco-SSLs) be used in preference to other screening values, when available. Because the Eco-SSLs are based on a more recent and comprehensive literature review, they are preferred over other available sources. Also, it appears that some of the most recently updated Eco-SSLs (e.g., Eco-SSL for copper, dated July 2006) may not have been used in Table 7-4. Finally, it is unclear whether Eco-SSLs were

considered for all receptor groups, or whether Eco-SSLs were used for terrestrial plants and invertebrates only. Section 7.4.1 should be revised to clarify this point, and screening values in Table 7-4 should be updated, if necessary.

Section 7.5.2, Exposure Estimation, Page 7-16

15. This section and Table 7-6 should be revised to clarify the toxic equivalency factors (TEFs) that were used to calculate 2,3,7,8-TCDD equivalents. Note that different TEFs are available for birds, mammals, and fish, and the applicable TEFs should be chosen according to the receptor(s) being evaluated. It should also be noted that TEFs are not available specifically for plants and invertebrates, and this data gap should be discussed in the uncertainties section (Section 7.7). Refer to EPA's *Draft Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment* (June 2003, available at <http://cfpub.epa.gov/ncea/raf/recordisplay.cfm?deid=55669>) for TEFs for birds and fish, and recently updated World Health Organization mammalian TEFs (May 2005, available at http://www.who.int/ipcs/assessment/tef_update/en/index.html).

Section 7.6.1, Selection of Ecological Chemicals of Potential Concern, Page 7-20

16. The final paragraph in this section acknowledges the potential for multiple chemicals to interact, and indicates that these interactions can be addressed by site-specific studies in Step 6 of the Navy ERA process. Given the well-established fact that toxicity to polycyclic aromatic hydrocarbons (PAHs) occurs additively (e.g., EPA's November 2003 *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks [ESBs] for the Protection of Benthic Organisms: PAH Mixtures*), the cumulative effects of PAHs should be considered in the SERA. This can be accomplished by summing the exposure concentrations of all PAHs and comparing the total PAH concentration to a total PAH screening level, or by summing the hazard quotients of the individual PAHs to calculate a single hazard index for PAHs. Although the methodology used in the SWMU 14 SERA has been approved for SERAs at other SWMUs, changes to the previously approved methodologies are sometimes needed to account for advances in the state of the science. Note that the outcome of this recommended change is that all PAHs will be brought forward as COPCs in the baseline ERA, rather than just the subset of PAHs currently identified in the SERA. The SERA should be revised accordingly.

Section 7.7, Uncertainties Associated with the Screening-Level Ecological Risk Assessment, Page 7-26

17. In the "Ecological Receptors" subsection of Section 7.7, the uncertainties associated with the omission of bats as receptors in the ecological risk evaluation should also be noted. The SERA should be revised accordingly.

Tables 6-1 through 6-3, Surface Soil/Subsurface Soil/Groundwater Data and COPC Selection Summaries

18. Based on a spot check of the RBC values and COPC selection process for a subset of compounds, NAPR appears to have selected site COPCs appropriately (i.e., in accordance with the Revised Final RFI Work Plan for SWMU 14 dated December 29, 2005, and discussion in Section 6.2.2). However, RBC values for the following carcinogenic PAHs are listed incorrectly in Tables 6-1 through 6-3 because they were updated in the October 2006 RBC Table: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene (see Specific Comment No. 6). The updated RBC values do not appear to affect the end result of the COPC selection process, but will alter the rationale behind retaining several PAHs (e.g., see benzo[k]fluoranthene on Table 6-1 and benzo[b]fluoranthene on Table 6-3). NAPR should verify the RBC values used in the COPC selection process and make the necessary changes to these tables to ensure that all information is presented accurately.

Figure 6-1, Conceptual Site Model

19. The Conceptual Site Model (CSM) figure includes ingestion of groundwater as a future exposure pathway for future adult construction workers. However, this exposure pathway is not discussed in the text (see page 6-8) and associated risks were not estimated (see Tables 6-15 and 6-16). NAPR should clarify whether this was simply an oversight, or whether ingestion of groundwater (i.e., from a potable water source or via incidental ingestion) is an exposure pathway that should be addressed, either qualitatively or quantitatively, for future construction workers. Figure 6-1 should also be corrected if necessary.
20. Inhalation of volatile emissions emanating from groundwater is discussed in the text (pages 6-7 to 6-8) as a potential future exposure pathway for both future adult and child residents; however, it was not included on the CSM figure for the child resident (see General Comment No. 1). Depending on the resolution of General Comment No. 1, Figure 6-1 should be revised or retained, as appropriate.

Figure 7-6, Preliminary Conceptual Model

21. Figure 7-6 indicates that mammals were evaluated quantitatively, when in fact, risks to mammalian receptors were *not* quantitatively evaluated. This figure should be revised to correct this error.