



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

OCT 25 2011

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. Mark E. Davidson  
US Navy  
BRAC PMO SE  
4130 Faber Place Drive, Suite 202  
North Charleston, SC 29405

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

- 1) SWMU 7 & 8 (Tow Way Fuel Farm) – Draft Work Plan for Monitored Natural Attenuation Groundwater Sampling, dated July, 2011
- 2) SWMU 56 (Hanger 200 Apron) – Final Corrective Measures Study (CMS) Report, dated September 29, 2011
- 3) SWMU 61 (Former Bundy Maintenance Facilities) – Draft Corrective Measures Study (CMS), dated March 18, 2011
- 4) SWMU 75 (Building 803 - Emergency Fire Deluge Pump House) – Revised Final Phase I RFI Report, dated September 22, 2011

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).

SWMU 7/8 (Tow Way Fuel Farm) – Final Work Plan for Monitored Natural Attenuation Groundwater Sampling

EPA has completed its review of both of the above document and the Responses to EPA's previous comments (transmitted with EPA's June 17, 2011 letter), both of which were submitted on behalf of the Navy by Mr. Tom Beisel's (of AGVIO/CH2MHill) letter of August 25, 2011. EPA does not fully approve the Work Plan or the Responses to Comments, and has a number of comments, which are discussed below and in the enclosed Technical Review, dated October 13, 2011 (Enclosure #1), which was prepared by our consultant, TechLaw Inc.

EPA notes that the Final Work Plan specifies that samples will be collected in accordance with the EPA Region 4 *Field Branches Quality System and Technical Procedures* (located at: <http://www.epa.gov/region4/sesd/fbqstp/index.html>) instead of EPA Region II's Ground Water Sampling Procedure for Low Stress (Low Flow) Purging and Sampling, GW Sampling SOP, Final, March 16, 1998. Please either revise the Work Plan to include the Region 2 Low Flow SOP, or compare the Region 4 procedures with those specified in the Region 2 SOP, and discuss the significance of any deviations that do exist between the Region 2 Low Flow SOP and the Region 4 procedures.

Within sixty (60) days of your receipt of this letter, please submit a revised Work Plan addressing the above comments as well as those in the enclosed Technical Review, dated October 13, 2011 (Enclosure #1).

Please note that EPA has not yet received comments from the Puerto Rico Environmental Quality Board (PREQB) on the revised Groundwater Sampling Work Plan. If PREQB's comments are received prior to the Navy submitting the revised Work Plan, please also incorporate any necessary revisions to address PREQB's comments in the revised Work Plan.

#### SWMU 56 (Hanger 200 Apron) -- Final Corrective Measures Study (CMS) Report

EPA has completed its review of both of the above document and the Responses to EPA's previous comments (transmitted with EPA's March 11, 2011 letter), both of which were submitted on behalf of the Navy by Mr. Mark Kimes' (of Michael Baker Inc.) letter of September 29, 2011. EPA has determined that the Navy's Responses to EPA's March 2011 comments are adequate, and that the Revised Final CMS Report is conditionally acceptable.

Nevertheless, while the Navy's Response to General Comment #5 of the Technical Evaluation dated March 1, 2011 (Enclosure #1 of EPA's March 11, 2011 letter) is adequate, EPA requests that henceforth the Navy assure that for all future RFI and CMS Final Reports submitted for SWMUs and Areas of Concern (AOCs) at the NAPR facility, the reports contain a tabulation by media that compares the sample quantitation limits (SQLs) (rather than reporting limits [RLs] or method detection limits [MDLs]) for each constituent to the risk-based screening criteria for that constituent, to confirm that the SQLs are sufficiently low to meet the risk-based concentrations used for the screening criteria.

EPA also notes that Section 11.4 (Schedule) states that a schedule is provided in Figure 11- 3; however, that figure is not included in the hard copy or CD of the Report. Within sixty (60) days of your receipt of this letter, please submit an updated schedule for implementation of the proposed corrective measures, including development and submission to EPA of a draft CMI Plan, including the "basis of design and plans and specifications", as per Section 11.2.1 (Presumptive Remedy CMI Design) of the CMS Report.

Also, please note that EPA's full approval of the recommended corrective measure as the final remedy is subject to completion of public review and comment, pursuant to the requirements of the 2007 Consent Order. Therefore, in preparation for such public review, within sixty (60) days of your receipt of this letter, please submit a draft Statement of Basis, summarizing the proposed corrective measure/final remedy.

The Puerto Rico Environmental Quality Board (PREQB) in its letter of October 17, 2011 addressed to myself, indicated the Responses to its previous comments were acceptable and that it approved CMI Plan. A copy of PREQB's letter is enclosed (Enclosure #2).

#### SWMU 61 (Former Bundy Maintenance Facilities) – draft CMS Report

EPA has completed its review of the above document which was submitted on behalf of the Navy by Mr. Mark Kimes' (of Michael Baker Inc.) letter of March 11, 2011. EPA does not fully approve the CMS Report, and has a number of comments, which are discussed below and in the enclosed Technical Review, dated September 29, 2011 (Enclosure #3), which was prepared by our consultant, TechLaw Inc.

Also, EPA notes that the CMS Report indicates in Section 10.0 (Justification and Recommendation) that "Copper and lead in PF03 surface water, barium, copper, lead, and mercury in PF03 sediment were indicated to present unacceptable risk to one or more of the receptor species/groups evaluated by the ERA." But then concludes that "...unknown sources upgradient of SWMU 61 may be responsible for elevated concentrations of copper, lead, and mercury in PF03 sediment and cadmium, copper, and mercury in PEM1 wetland sediment" and recommends that the CMS not include recommendations for corrective measures within the PF03 and PEM1B wetland units. EPA does not concur with that approach, and will not approve the CMS unless all contamination identified in the SWMU 61 area is addressed, either as part of the CMS for SWMU 61 or as part of the corrective actions for another existing SWMU or Area of Concern (AOC), or a new SWMU or AOC.

At this point in the investigation and corrective measures implementation at the former NAPR facility, EPA recommends that the Navy address the contamination detected at the PF03 and PEM1B wetland units adjacent to SWMU 61 as part of the corrective measures for that SWMU, rather than proposing to address it through additional actions for either an existing SWMU or AOC, or a newly identified SWMU or AOC. Therefore, within seventy five (75) days of your receipt of this letter, please either revise the CMS Report to address the contamination within the PF03 and PEM1B wetland units, or submit a work plan to fully characterize the nature and extent of that contamination as part of additional actions for an existing SWMU or AOC, or for a new SWMU or AOC that includes the contamination within the PF03 and PEM1B wetland units.

Also, in Section 8.3.1.2.1 of the Report (COPC Selection Criteria, USEPA Regional Screening Levels), on page 8-5, it is indicated that the May 2010 version of the EPA Regional Screening Levels (RSL) table was used in the HHRA. Please note that RSLs were updated in June 2011, and that the Navy should utilize the latest version of the RSL table in the COPC identification

process in the revised HHRA. However, if older RSLs (May 2010) are retained in the CMS, Section 8.3.6 of the Report (Sources of Uncertainty) should be revised to discuss the potential impacts to COPC selection by using older RSLs (May 2010) rather than the most current RSLs available. This is especially important for COPCs whose toxicity criteria are made significantly more stringent. Changes in toxicity criteria which reflect a decrease in associated toxicity (e.g., vanadium) are of lower importance, except where these changes could significantly affect financial decision-making for corrective action.

Therefore, within seventy five (75) days of your receipt of this letter, please submit a revised CMS Report, addressing the above comments and those in enclosed Technical Review, dated September 29, 2011 (Enclosure #3), and if necessary, a work plan to address the contamination within the PF03 and PEM1B wetland units as part of either an existing, or newly identified, SWMU or AOC.

Please note that EPA has not yet received comments from the PREQB on the draft CMS Report. If PREQB's comments are received prior to the Navy submitting the revised CMS Report, please also incorporate any necessary revisions to address PREQB's comments in the revised CMS Report.

#### SWMU 75 (Building 803- Emergency Fire Deluge Pump House) – Revised Final Phase I RFI Report

EPA has completed its review of the above document which was submitted on behalf of the Navy by Mr. Mark Kimes' (of Michael Baker Inc.) letter of September 22, 2011. EPA in my letter of May 20, 2011 had previously approved the Final Phase I RFI Report and the March 1, 2011 Responses to EPA's previous comments (transmitted with EPA's December 8, 2010 letter). The September 22, 2011 Final Phase I RFI Report was submitted to address comments made by PREQB. EPA will approve the September 22, 2011 Revised Final Phase I RFI Report, and the recommendation that a Full RFI is required.

However, as discussed during the joint Technical Meetings held between the Navy, EPA, and PREQB on September 29, 2011 at the NAPR facility, if the draft Full RFI Work Plan, when developed, does not include a proposal to further assess PAH and metals releases to the surface and subsurface soils or metals in the groundwater at the SWMU 75 area (based on the Navy's assertion that groundwater usage at the SWMU 75 area is not considered feasible due to high salinity) as is recommended in Section 7.2 of the Final Phase I RFI Report, EPA will then anticipate that future usage of the SWMU 75 site should be restricted to non-residential usage, due to uncertainties regarding the full nature and extent of metals contamination in the surface and subsurface soils and in the groundwater at the SWMU 75 area.

In addition, as previously stated in my letter of May 20, 2011, since semivolatile organic compounds and metals were detected in surface and subsurface soil during the Phase I RFI at concentrations exceeding applicable screening criteria, and given the close proximity of SWMU 75 to Ensenada Honda, it is possible that the detected constituents could have also migrated

towards and impacted sediments in Ensenada Honda. Therefore, EPA requests that the Full RFI Work Plan, when developed, should include a discussion of previously collected analytical data from the sediments of Ensenada Honda in the vicinity of SWMU 75, along with an assessment of the need for additional investigations of possible impacts from SWMU 75 to the sediments of Ensenada Honda.

The Puerto Rico Environmental Quality Board (PREQB) in its letter of October 11, 2011 addressed to myself, indicated the Responses to its previous comments were acceptable and that it approved CMI Plan. A copy of PREQB's letter is enclosed (Enclosure # 4).

Pursuant to your letter of October 6, 2011, EPA will approve the Navy's request to submit the draft Full RFI Work Plan for SWMU 75 by December 23, 2011. EPA will also approve the submission dates for the other items as proposed in your letter of October 6, 2011.

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

Sincerely yours,



Timothy R. Gordon  
Project Coordinator  
Corrective Action and Special Projects Section  
RCRA Programs Branch

Enclosure (4)

cc: Ms. Wilmarie Rivera, P.R. Environmental Quality Board, w/encls. #1 & #3 only  
Ms. Gloria Toro, P.R.Environmental Quality Board w/encls. #1 & #3 only  
Mr. Tom Beisel, AGVIO/CH2MHill, w/encls.  
Mr. Mark Kimes, Baker Environmental, w/encls.  
Mr. Stacin Martin, US Navy, w/encls.  
Ms. Cathy Dare, TechLaw Inc., w/o encls.  
Mr. Felix Lopez, USF&WS, w/o encls.

**Enclosure #1**

**TECHNICAL REVIEW OF THE  
RESPONSE TO EPA COMMENTS ON THE WORK PLAN FOR MONITORED  
NATURAL ATTENUATION GROUNDWATER SAMPLING AT SWMU 7/8**

**NAVAL ACTIVITY PUERTO RICO  
EPA ID No. PR2170027203  
CEIBA, PUERTO RICO**

**DATED JUNE 2011**

**Submitted to:**

**U.S. Environmental Protection Agency  
Region 2  
290 Broadway  
New York, NY 10007-1866**

**Submitted by:**

**TechLaw, Inc.  
205 West Wacker Drive  
Suite 1622  
Chicago, Illinois 60606**

**EPA Task Order No.  
Contract No.  
TechLaw TOM  
Telephone No.  
EPA TOPO  
Telephone No.**

**002  
EP-W-07-018  
Cathy Dare  
315-334-3140  
Timothy Gordon  
212-637-4167**

**October 13, 2011**

**TECHNICAL REVIEW OF THE  
RESPONSE TO EPA COMMENTS ON THE WORK PLAN FOR MONITORED  
NATURAL ATTENUATION GROUNDWATER SAMPLING AT SWMU 7/8**

**NAVAL ACTIVITY PUERTO RICO  
EPA ID No. PR2170027203  
CEIBA, PUERTO RICO**

**DATED JUNE 2011**

The following comments were generated based on a technical review of the Response to EPA Comments on the *Work Plan for Monitored Natural Attenuation Groundwater Sampling at Solid Waste Management Unit (SWMU) 7/8*, Naval Activity Puerto Rico (NAPR), EPA ID PR2170027203, Ceiba, Puerto Rico, dated June 2, 2011 (hereinafter referred to as the Responses). The Responses were reviewed to determine whether EPA's comments on the *Draft Work Plan for Monitored Natural Attenuation Groundwater Sampling at SWMU 7/8*, dated February 2011 (Draft Work Plan), were addressed adequately, and that any necessary revisions were incorporated appropriately into the *Final Work Plan for Monitored Natural Attenuation Groundwater Sampling at SWMU 7/8*, dated July 2011 (Final Work Plan). Only those comments that require additional clarification and/or revision to the Final Work Plan are described below.

#### **GENERAL COMMENTS**

**Evaluation of the Response to EPA General Comment 1:** The response partially addresses the comment. While the response helps clarify the relationship between the current understanding of the dissolved contaminant plume and light nonaqueous phase liquid (LNAPL) footprint and historical interruptions of the footprints, the Final Work Plan was not revised to include this information. As a result, the information used to illustrate that the extent of LNAPL is less than previously documented is not explained in the Final Work Plan. Also, information is not provided in the Final Work Plan to show which areas of dissolved contamination, depicted in the corrective measures study (CMS), need to be remediated to achieve the corrective action objectives (CAOs).

The response indicates that monitored natural attenuation (MNA) remains a viable remedial alternative for groundwater because concentrations of benzene, ethylbenzene, and 1,2,4-trimethylbenzene (1,2,4-TMB) attenuated to non-detect concentrations immediately south of Forrestal Drive. However, information to substantiate that the lack of benzene, ethylbenzene and 1,2,4-TMB detections south of Forrestal Drive is attributed to attenuation is not provided. As a result, the conclusion that MNA is a viable remedial alternative for groundwater based on non-detect concentrations of benzene, ethylbenzene and 1,2,4-TMB south of Forrestal Drive is not supported.

Revise the Final Work Plan to incorporate the information provided in the response to help clarify the relationship between the current understanding of the dissolved contaminant plume and LNAPL footprint and historical interruptions of the footprints. Also, revise the Final Work

Plan to include a figure showing the current understanding of the dissolved contamination, clearly indicating the portions of the footprints that require remedial action to meet CAOs. In addition, revise the Final Work Plan to provide information to substantiate that MNA is a viable remedial alternative with the presence of LNAPL. OSWER Directive 9200.4.-17P, entitled Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, dated April 21, 1999, indicates that source control measures are a necessary compliment to MNA, and include removal, treatment, or containment, or a combination of these approaches. EPA's stated preference is for remedial options which remove free-phase NAPLs and treat those source materials determined to constitute "principal threat wastes". MNA does not satisfy the statutory preference for treatment because it is not a dynamic-active treatment method and should not be used in source areas as a source control or interim measure. Further, it should not be used as a remedial method where the geochemical conditions do not support it, or where the plumes are not stable or are increasing in size. However, in situations where source control will not be attempted by MNA, and where all other conditions support its selection, it is accepted by EPA as a viable remedial alternative

**Evaluation of the Response to EPA General Comment 3:** The response addresses the comment; however, the Final Work Plan was not revised to include the information provided in the response. Revise the Final Work Plan to incorporate the information provided in the response to clarify the sampling frequencies proposed for total arsenic and total manganese.

## **SPECIFIC COMMENTS**

**Evaluation of the Response to EPA Specific Comment 2:** The response addresses the comment; however, the text does not include the commitment to annually assess the need to continue quarterly sampling and refine the initial rates determined based on two years of data, given that they will represent initial estimates that must be refined over time. Revise the Final Work Plan to include this commitment, ensuring the yearly reports indicate what removal mechanisms the total attenuation rate likely includes.

**Evaluation of the Response to EPA Specific Comment 8:** The response does not address the comment. The previous investigations [i.e., aquifer performance test (APT), slug tests, product bail down tests, product recovery rate evaluation, and double-ring infiltrometer test] conducted by Blasland, Bouck, and Lee, Inc. (BB&L) in April 1994 and presented in *Site Characterization, Tow Way Fuel Facility, Roosevelt Roads Naval Station, Ceiba, Puerto Rico*, dated February 1994 (Site Characterization Report) do not provide information on the vertical groundwater flow and therefore the vertical extent of contamination associated with the dissolved contaminant plume. Based on the Site Characterization Report, the determination that the soil acts as a confining or semi-confining unit and groundwater is confined or partially confined is based on observations made during monitoring well installation. Further, it does not appear that previous investigations were conducted within the weathered volcanic rock and unweathered volcanic rock to determine vertical groundwater gradients between the overburden and bedrock. As such, insufficient information is provided to determine vertical groundwater flow. Thus, the conclusion in the response that the vertical extent of the groundwater contamination plume is defined is unsubstantiated. Revise the Final Work Plan to provide information from previous investigations to support the conclusion that the vertical extent of the groundwater contaminant plume is defined or ensure that the Final Work Plan addresses this data gap.



COMMONWEALTH OF PUERTO RICO  
Office of the Governor  
Environmental Quality Board



ENC. # 2

ENVIRONMENTAL EMERGENCIES RESPONSE AREA

October 17, 2011

Mr. Timothy Gordon  
U.S. Environmental Protection Agency – Region II  
290 Broadway – 22<sup>nd</sup> Floor  
New York, New York 10007-1866

**Re: Review Response to Comments and  
Final Corrective Measures Study  
Report for SWMU 56 – Hangar 200 Apron  
Naval Activity Puerto Rico, Ceiba  
EPA ID NO. PR2170027203**

Dear Mr. Gordon:

The Hazardous Wastes Permits Division (HWPD) and the Federal Facility Coordinator has finished the review of the Final Corrective Measures Study Report for SWMU 56 – Hangar 200 Apron. The document was submitted by Michael Baker on behalf of the Navy.

The document adequately addressed and incorporate PREQB comments. Hence, PREQB will not issue additional comments and recommends the acceptance of the document as final. If you have any additional comment or question please feel free to contact Gloria M. Toro Agrait at (787) 767-8181 extension 3586 or myself at extension 6129.

Cordially,

Wilmarie Rivera  
Federal Facilities Coordinator  
Environmental Emergencies Response Area

cc: Gloria M. Toro Agrait, EQB Hazardous Waste Permits Division  
Mark E. Davidson, US Navy, BRAC PMO SE

**REVIEW OF THE DRAFT CORRECTIVE MEASURES STUDY  
REPORT FOR SWMU 61  
DATED MARCH 18, 2011**

**NAVAL ACTIVITY PUERTO RICO  
CEIBA, PUERTO RICO  
EPA ID No. PR2170027203**

**Submitted to:**

**U.S. Environmental Protection Agency  
Region 2  
290 Broadway  
New York, NY 10007-1866**

**Submitted by:**

**TechLaw, Inc.  
205 West Wacker Drive  
Suite 1622  
Chicago, Illinois 60606**

**EPA Task Order No.  
Contract No.  
TechLaw TOM  
Telephone No.  
EPA TOPO  
Telephone No.**

**002  
EP-W-07-018  
Cathy Dare  
315-334-3140  
Timothy Gordon  
212-637-4167**

**September 29, 2011**

**REVIEW OF THE DRAFT CORRECTIVE MEASURES STUDY  
REPORT FOR SWMU 61  
DATED MARCH 18, 2011**

**NAVAL ACTIVITY PUERTO RICO  
CEIBA, PUERTO RICO  
EPA ID No. PR2170027203**

The following comments were generated based on a technical review of the *Draft Corrective Measures Study Report for SWMU 61*, for the Naval Activity Puerto Rico facility in Ceiba, Puerto Rico (CMS Report).

**GENERAL COMMENTS**

1. The Human Health Risk Assessment (HHRA) employs the Johnson and Ettinger Model (JEM) to model indoor air impacts from vapor intrusion. Revise the HHRA to address the following:
  - a. The HHRA should be revised to include a table that compares volatile organic compounds (VOCs) in groundwater to Table 2c groundwater target levels from EPA's *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*, dated November 2002 (Subsurface VI Guidance). Where exceedances of Table 2c criteria exist, clarify if exceedances are located within 100 feet vertically or laterally of an occupied, or potentially occupied, building. If a building exists within 100 feet vertically or laterally from the exceedance(s), the subject building(s) should be considered for an evaluation of vapor intrusion potential by collecting additional data which could include synoptically-paired sub-slab soil gas and indoor air samples to determine building-specific chemical-specific attenuation factors. Further, please note that if site-related volatile organic compounds (VOCs) extend off-site, an additional vapor intrusion assessment may be required.
  - b. Based on a review of the groundwater data, VOCs (e.g., trichloroethylene, tetrachloroethylene) exceed Table 2c target groundwater levels. While no buildings are currently present at SWMU 61, Building 1686 is located at the northeastern boundary of SWMU 61 and the closest groundwater sample to this building (~100 feet south, Sample 61SB22, surface, subsurface, and groundwater sampling location) exhibited tetrachloroethylene slightly above its respective Table 2c target groundwater level. Also, it is unclear if VOCs in groundwater have been adequately characterized near/beneath Building 1686. Revise the HHRA to provide the complete decision rationale for not collecting subslab soil gas and indoor air samples at Building 1686 to evaluate vapor intrusion potential.
  - c. Section 8.3.3.1, Johnson and Ettinger Model, should be revised to reference the subsections that summarize the JEM results for future hypothetical adult and child residents and future industrial/commercial workers. This section as well as relevant subsections should reference the JEM output/results in Appendix L, Risk Calculation Spreadsheets. However, it was noted that while the JEM results for the future industrial/commercial worker were listed in the risk and hazard summary tables, the

actual JEM output was not provided in Appendix L. Revise Appendix L to include the JEM output for all applicable receptors.

- d. Maximum groundwater VOC concentrations were not used in the JEM. Currently, risk for the vapor intrusion to indoor air pathway exceeds  $1E-06$  for both future residents and industrial/commercial workers. Revise the JEM to ensure that maximum VOC concentrations are used and update all associated text, tables and appendices to reflect the updated risk values.
  - e. Please note that EPA no longer supports use of the JEM to provide reliable decision criteria proving the negative condition. To restate: When exceedances of the Table 2c criteria are evident, the JEM, tailored to site-specific conditions, cannot be used to support the conclusion that VI potential is insignificant with regard to human health risk or hazard. JEM can be used to bolster the decisions supporting the need for a site-specific VI assessment or as a prioritization tool at sites with multiple exposure locations (for further investigation). Please revise the document to reflect EPA's position with respect to the utility of JEM as a platform for supporting site and risk management decision-making.
2. The most current oral reference dose (RfD) for thallium is  $1E-05$  mg/kg/day<sup>-1</sup> and the most current oral RfD for vanadium is  $5E-03$  mg/kg/day<sup>-1</sup> (and currently an inhalation RfC is not available for vanadium, though an inhalation RfC is available for vanadium pentoxide). Revise the HHRA to utilize the latest available toxicity factors to quantify risk and hazard.
  3. Hazard indices (HI) greatly exceed 1.0 for various current and future human site receptors due to potential contact with vanadium in soil and groundwater (cobalt is an additional hazard driver regarding groundwater exposures for a future child resident). However, NAPR should consider reevaluating exposure to vanadium in the HHRA using the most current EPA Regional Screening Levels (RSLs) and toxicity data. The current EPA RSLs and toxicity data for vanadium are less stringent than those used in the HHRA and have the potential to impact the resulting HIs. At NAPR's discretion, consider revising the HHRA to utilize the most current EPA RSLs and toxicity data for vanadium (i.e., available from the EPA June 2011 RSL table) or evaluate associated excess conservatism within the context of the uncertainty analysis.
  4. Chemicals that exceeded risk-based screening criteria were selected as chemicals of potential concern (COPCs) regardless of background concentrations. Then, as part of the risk characterization, naturally occurring compounds are evaluated based on background levels to determine if concentrations are indicative of background or site-related activities. There is currently no established background data set for NAPR base-wide *total* soil, so for the purposes of the background analysis, the established background data sets for NAPR base-wide surface soil and clay subsurface soil were combined. It is unclear from the HHRA if the total soil data set should incorporate clay subsurface soil or fine sand/silt subsurface soil. From a review of the *Revised Final II Summary Report for Environmental Background Concentrations of Inorganic Compounds*, dated February 2008 (Background Summary Report), the closest background subsurface sample to SWMU 61 (Sample 8E-SB01-01)

consists of fine sand/silt subsurface soil. Revise the HHRA to provide the complete decision rationale for preferentially selecting clay subsurface soil data in the HHRA background characterization.

Further, the HHRA indicates that there are currently no established background data sets for PEM1B wetland sediment, PEM1B wetland surface water, or PFO3 wetland surface water. The background analysis for PEM1B wetland sediment was performed using PEM1B wetland reference sediment and there were no background analyses conducted for surface water. For completeness, clarify in the HHRA why surface water and sediment data presented in the Background Summary Report are not appropriate for the SWMU 61 background analysis and refinement of COPCs.

5. It was not possible to independently verify the wildlife Hazard Quotients (HQs) presented in Tables 7-25 to 7-28 because the report does not provide the receptor-specific Estimated Daily Doses (EDDs) used to calculate these HQs. The EDD for each receptor derived from the equation provided in Section 7.5.2.2.2 (Dietary Intakes) and using the maximum concentrations in surface/subsurface soil, surface water, and sediment must be available to calculate the HQs by dividing the EDDs by their toxicity values. The exposure parameters and dietary compositions are provided in Tables 7-16 and 7-17, respectively, but the receptor-specific EDDs are not presented. Include a separate set of tables to show the EDDs for each receptor used in the HQ calculations so that the calculations can be independently verified.
6. The sizes of the data sets for wetland PFO3 surface water (8), wetland sediment (10) and wetland PEM1B surface water (11) are too small to draw conclusions about the entire wetland areas. Provide a comment in the uncertainty section acknowledging the small number of samples and the possible bias associated with a small data set for each media.
7. The CMS Report states that completeness goals have been met, but does not provide the calculated percent completeness. Revise the report to provide the percent completeness calculations for the 2008, 2010 and the combined data sets. Further, it is recommended that the percent completeness of each analytical group in both 2008 and 2010 be provided. Revise the CMS Report to provide this information in a more detailed percent completeness discussion.

## **SPECIFIC COMMENTS**

1. **Section 6.3, Groundwater, Page 6-4:** The nature and extent of trichloroethylene (TCE) in groundwater at SWMU 61 is not well defined. The characterization to date does not meet the CMS Work Plan objective "to delineate the groundwater contamination". The highest concentration of TCE was detected in monitoring well 61SB23 in the north central portion of the SWMU. TCE was detected in three other wells (61SB05, 61SB06 and 61SB22) that roughly align on a northeast trend (Figure 8-3). The concentrations decrease in an up and slightly cross gradient direction (Figure 5-4) which is contrary to what you would expect to see based on the indication in the CMS Report that the TCE source is the adjacent up gradient combined plume of TCE and benzene (SWMU 54). Additionally, benzene was not

detected in the four wells that contained TCE discussed above. Although the data are limited, the findings may indicate a potential source of TCE in soil or groundwater at SWMU 61. Revise the CMS Report to justify why further characterization of the nature and extent of TCE in groundwater is not required. As part of this justification, present or discuss data from SWMU 54 investigations which show the plume that is present upgradient of 61SB05, 61SB06, 61SB22 and 61SB23, and the magnitude and direction of the plume's movement.

2. **Section 7.6.2.8.1, Dietary Exposures to Chemicals in Surface Soil, and Section 7.6.2.8.2, Dietary Exposures to Chemicals in Subsurface Soil, Page 7-38.** Section 7.6.2.8.1 discusses Table 7-25 which presents the HQs for avian and mammalian dietary exposures to chemicals in surface soil. Chemicals with HQs above 1.0 are discussed for the brown flower bat and the American robin. The mourning dove and red-tailed hawk, both of which have several chemicals with HQs above 1.0, are not mentioned in this section. The same is true for Section 7.6.2.8.2 which discusses Table 7-26 (Hazard Quotients for avian and mammalian dietary exposures to chemicals in subsurface soil). Several chemicals in subsurface soil have HQs above 1.0 for the mourning dove and red-tailed hawk. Discuss these two receptors, and the chemicals with HQs above 1.0, in their respective sections.
3. **Section 7.6.2.8.2, Dietary Exposures to Chemicals in Subsurface Soil, Page 7-38:** The text discusses Table 7-26 which presents the HQs for avian and mammalian dietary exposures to chemicals in subsurface soil. Barium and selenium have HQs above 1.0 and are discussed in this section, along with 22 semivolatile organic compounds (SVOCs) and two VOCs which are identified as ecological COPCs based on a lack of Toxicity Reference Values (TRVs). Pentachlorophenol is not listed as a COPC in this section but is listed in Section 7.9.1.8.2 under the Step 3a risk evaluation as a COPC. Pentachlorophenol, with a HQ of 17.03 (See Table 7-26), needs to be recognized as a COPC in this section.
4. **Section 8.3.1.1, Data Evaluation, Page 8-3:** The last sentence of the first paragraph on page 8-3 states, "Based on the lack of validation, the surface water and sediment data [collected during the 2004 Phase II Environmental Condition of Property (ECP) Investigation] were deemed unacceptable for use in the HHRA. However these data are presented in Tables 6-1 through 6-4 of this report." Revise Section 8.3.6, Sources of Uncertainty, to discuss any potential impacts to the risk assessment due to the exclusion of these data.
5. **Section 8.3.1.1, Data Evaluation, Page 8-3:** It is unclear from Section 8.3.1.1 why pesticides/herbicides, polychlorinated biphenyls (PCBs), and dioxins/furans were not analyzed as part of the CMS field investigation. Revise Section 8.3.1.1 to provide the decision rationale supporting exclusion of pesticides/herbicides, PCBs and dioxins/furans from the target analyst list during the CMS field investigation and subsequent evaluation in the HHRA, or alternatively, clarify how the apparent data gaps will be addressed.
6. **Section 8.3.1.2.3, Selection of COPCs, Groundwater, Page 8-8:** Please refer to General Comment No. 1, regarding screening of the vapor intrusion to indoor air pathway, and update this section accordingly.

7. **Section 8.4.2, Quantitative Corrective Action Objectives (CAOs), Page 8-34:** This section states:

*“Carcinogenic risks were greater than USEPA’s target risk range of 1E-06 to 1E-04 for the future residential receptors primarily as a result of carcinogenic PAHs [polynuclear aromatic hydrocarbons] in PFO3 wetland surface water. However, the carcinogenic PAHs are not considered site-related for the following reasons. The carcinogenic PAHs were detected at relatively low concentrations (less than one part per billion) in only one PFO3 wetland surface water sample (61SW01), which is the furthest upgradient of the PFO3 wetland surface water samples, and there were no carcinogenic PAHs detected in any other surface water samples. Furthermore, there were no carcinogenic PAHs detected in soil or groundwater samples collected from that area of the SWMU (specifically, sample locations 61SB20, 61SB22, 61SB43, and 61SB45).”*

Section 10.2.2, Human Health Considerations, indicates that an institutional control restricting future residential land and groundwater use will be implemented as a human health qualitative Corrective Action Objective (CAO) for SWMU 61, which is appropriate. However, the conclusion that PAHs at SWMU 61 are not site-related is not fully supported. Various PAHs were selected as COPCs in other media (e.g., surface soil, total soil, sediment) as well, and associated risk falls within the risk management range for various receptors due to PAH exposure. Also, it should be noted that the range of detection limits for PAHs is quite large (e.g., the range of detection limits for benzo(a)pyrene in soil is 0.72 ug/kg to 700 ug/kg, and the upper range significantly exceeds the screening level of 15 ug/kg for this compound); thus, it is unclear if PAHs at SWMU 61 have been adequately characterized. Revise the HHRA to exclude statements that suggest that PAHs are not site-related, or alternatively, revise the HHRA to further support such conclusions based on site data.

8. **Section 11.1, Conceptual Design, Page 11-1:** This section does not discuss the future of the existing monitoring wells. There should be some discussion on abandonment or maintenance, or both, depending on the design and future use. Revise the text to address the proposed abandonment or maintenance of the existing monitoring wells.
9. **Table 8-8, Summary of Exposure Parameters:** An exposure frequency (EF) of 50 days/year and an exposure time (ET) of 2 hours/day are used to evaluate groundwater exposures to a future construction worker. It is understood that workers will not be routinely exposed (via direct contact) to infiltrating groundwater for extended periods of time and the importance of maintaining dewatering measures during remediation and construction. However, the presentation should discriminate between an ET associated with direct contact exposures and an ET associated with indirect (inhalation) exposures. Consider utilizing an ET of 4 hours/day to evaluate inhalation of off-gassing VOCs from groundwater under trench exposure conditions. Also, a particulate emission factor (PEF) of  $3.11E-06 \text{ m}^3/\text{kg}$  is used for a future construction worker, however, the associated PEF calculation is not provided in Appendix L. Revise the HHRA to include the associated PEF calculation, consistent with

EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (2002).

10. **Appendix C, Data Validation Report (DVR) for SDG 37299-1, Page 7:** The matrix spike (MS) discussion indicates that antimony, barium and lead did not meet acceptance limits, and are noted in the table. However, the table indicates that nickel results were outside control limits. Revise the DVR to correct this discrepancy and ensure the table and text present consistent information. Note, this also may apply to the Summary of Data Qualifications provided at the end of the DVR.
11. **Appendix C, DVR for SDG 37406-1, Page 8:** The DVR qualifies mercury results as estimated due to low matrix spike recoveries, but does not reject results even though one of the recoveries is less than 10%. According to the Region II SOP for Evaluation of Metals Data (pg 30), if more than one spike is analyzed with a Sample Delivery Group (SDG), the results should be qualified based on the worst spiked sample. Therefore, the mercury results in this SDG should be rejected, and not qualified as estimated. Revise the DVR to qualify these results as rejected and ensure that all DVRs consistently do this.
12. **Appendix C, SDG NAPR551211-1, Multiple Pages:** This DVR does not provide the extent of all QC outliers. For example, page 6 notes the ICSA is out for metals but does not provide the extent. Further, page 7 notes an internal standard is out for VOC sample 61SB25-00 and that several SVOC internal standards exhibited low recoveries in SVOC samples but does not provide the extent. Revise the DVR to provide the extent of all QC outliers. Further, ensure all DVRs provide this information.

#### MINOR COMMENTS

1. **Section, 7.9.1.1 Step 3a Risk Evaluation for Surface Soil, Page 7-57:** The text states that all of the detected concentrations for vanadium exceeded the surface soil screening value of 10 mg/kg. However, the soil screening value for vanadium listed in Tables 7-4 and 7-19 is 20.0 mg/kg, which is the correct value from the referenced source. The HQs referenced in the text for vanadium in Table 7-18 (HQ = 23) and Table 7-35 (HQ = 11.66) are also incorrect. The maximum and 95% UCL value must be divided by 20, instead of 10, resulting in HQs of 11.5 in Table 7-18 and 5.83 in Table 7-35. The values are accurate in the tables; only the text needs to be corrected.
2. **Section 8.2, Land Use and Potentially Exposed Receptors, Page 8-1:** This section does not specify there are no current structures present at SWMU 61 with the capacity to provide a venue for VI-associated indoor air exposures. Revise Section 8.2 to address this discrepancy.
3. **Section 8.3.2.1, Potential Human Receptors and Exposure Pathways, Page 8-12:** The last paragraph on this page states, "Currently, there are unoccupied buildings located within the boundary of SWMU 61." However, site figures indicate that no current buildings are present on-site, though Building 1686 is located just outside of the northeastern boundary. Revise Section 8.3.2.1 to resolve the apparent discrepancy.



COMMONWEALTH OF PUERTO RICO  
Office of the Governor  
Environmental Quality Board



ENCL. # 4

ENVIRONMENTAL EMERGENCIES RESPONSE AREA

October 11, 2011

Mr. Timothy Gordon  
U.S. Environmental Protection Agency – Region II  
290 Broadway – 22<sup>nd</sup> Floor  
New York, New York 10007-1866

**RE: REVIEW REVISED FINAL  
RCRA FACILITY INVESTIGATION (RFI)  
REPORT FOR SWMU 75 – BUILDING 803  
NAVAL ACTIVITY PUERTO RICO, CEIBA  
EPA ID NO. PR2170027203**

Dear Mr. Gordon:

The Hazardous Wastes Permits Division (HWPD) and the Federal Facility Coordinator has finished the review of the Revised Final RFI Report for SWMU 75 – Building 803. The document was submitted by Michael Baker on behalf of the Navy.

The document adequately addressed and incorporate PREQB three rounds of comments. Hence, PREQB will not issue additional comments and recommends the acceptance of the document as final. If you have any additional comment or question please feel free to contact Gloria M. Toro Agrait at (787) 767-8181 extension 3586 or myself at extension 6129.

Cordially,

Wilmarie Rivera  
Federal Facilities Coordinator  
Environmental Emergencies Response Area

cc: Gloria M. Toro Agrait, EQB Hazardous Waste Permits Division  
Mark E. Davidson, US Navy, BRAC PMO SE



COMMONWEALTH OF PUERTO RICO  
**Office of the Governor**  
**Environmental Quality Board**



---

*ENVIRONMENTAL EMERGENCIES RESPONSE AREA*

May 18, 2011

Timothy Gordon  
US Environmental Protection Agency – Region II  
290 Broadway – 22<sup>nd</sup> Floor  
New York, New York 10007-1866

**Re: Technical Review of the Draft  
Corrective Measures Study Report  
SWMU 61 – Former Bundy Area Maintenance Facility  
Naval Activity Puerto Rico  
Ceiba, PR2170027203**

Dear Mr. Gordon:

The Federal Facility Coordinator (FFC) and the Hazardous Wastes Permits Division (HWPD) has finished the review of the above-mentioned document. Our comments are provided in the attachment.

We want to highlight that there are some comments (comment # 38 and # 42a) where we stated our preference regarding some technical issues, however, we will defer to EPA on both issues. Please provide special attention to those comments we will be waiting for your input.

If you have any additional comments or questions please feel free to contact Gloria M. Toro Agrait at (767) 787-8181 extension 3586 or myself at extension 6129.

Cordially,

Wilmarie Rivera  
Federal Facilities Coordinator  
Environmental Emergencies Response Area

cc. Gloria M. Toro Agrait, Environmental Permits Officer

Cruz A. Matos Environmental Agencies Building  
Ave. Ponce de León 1375, San Juan, PR 00926-2604  
PO Box 11488, San Juan, PR 00910  
Tel. 787-767-8181

**Technical Review of the Draft Corrective Measures Study Report for SWMU 61 –  
Former Bundy Area Maintenance Facility, US Naval Activity Puerto Rico, Ceiba,  
Puerto Rico dated March 18, 2011**

**GENERAL COMMENTS**

1. Puerto Rico's Water Quality Standards Regulation has been updated since the original Corrective Measures Study was prepared. The current version, dated March 2010, classifies all groundwater as SG, waters intended for use as a drinking water supply. Please address this Applicable or Relevant and Appropriate Requirement (ARAR) in the human health risk assessment and development of quantitative and qualitative Corrective Action Objectives (CAOs).
2. The 2010 Addendum to the Reuse Plan for NAPR considers tourism-related or residential development for the Bundy area. Please revise the discussions of land use (Sections 8.2 and 8.3.2.1) and the development of qualitative CAOs (Section 9.0) to address the current land use plan for this area.
3. As stated in the report, additional investigation is recommended to identify the source of various metals (i.e., cadmium, copper, lead, mercury and zinc) that were detected at elevated concentrations (i.e., above background concentrations and levels potentially associated with adverse effects to aquatic organisms and higher trophic level species that forage within the PEM and PFO wetlands). Please ensure that a BERA is conducted for these wetlands regardless of whether an additional source of metals is identified for these wetlands.
4. All nondetect results from the 2008 investigations were reported at the method detection limit (MDL) instead of the reporting limit. Please report nondetect data using the reporting limit (RL) rather than the MDL, consistent with Table 3-2 of the original 2007 work plan and Table 4-4 in this report. Note that the use of maximum MDLs is not a conservative measure for evaluating nondetect chemicals in either the ecological risk assessment or human health risk assessment. Please revise using RLs. Alternatively, please report nondetects at the limits of quantitation in accordance with Department of Defense (DOD) Quality Systems Manual version 4 and revise the risk assessments accordingly.
5. For all validation reports in Appendix C, it appears that when blank qualification occurred in all analyses, the validator qualified the associated samples as nondetect (U) at the reported concentration. In many cases, the reported concentrations were below the reporting limit. Therefore, the new nondetect result at this "reported concentration" is not an accurate reflection of the actual nondetect value. As per the EPA Region 2 validation guidelines, sample results below the reporting limit should be raised to the reporting limit if affected by the blank contamination. Please revisit all validation memos and apply qualifications in accordance with EPA Region 2 procedures.

## PAGE-SPECIFIC COMMENTS

1. Section 4 and Table 4-1: Please clarify why the 11 surface water samples collected from the PEM1B wetland were not subjected to VOC analysis; however those that were collected from the PF03 wetland were subjected to VOC analysis.
2. Section 4.1: Please clarify in the text whether the sample aliquots for VOC analysis were collected in accordance with EPA Method 5035. In addition, please note if the sample aliquots for SVOC and metals analysis were homogenized prior to being placed into the sample collection jars.
3. Page 4-4, Section 4.1, Surface and Subsurface Soil Sampling, 2008 CMS Investigation, Bullet #3: The text states that sample 61SB10 was intended to investigate the cleared area “southwest” of the building. However, as per Figure 4-1, this should state “southeast” of the building.
4. Page 4-5, Section 4.1, Surface and Subsurface Soil Sampling, 2010 Additional Sampling Investigation:
  - a. Paragraph 1: Please revise the text to state “seven” borings were located in the northwest portion of the site instead of “six”, as per Table 4-1.
  - b. Paragraph 2: Please include Appendix IX VOCs in the list of analytical parameters for surface soil samples, as per Table 4-1.
5. Sections 4.2 and 4.3: Please confirm in the text of one or both of these sections whether the surface water samples were collected prior to the co-located sediment samples in order to minimize disturbance of the surface water and to minimize the amount of suspended sediment entrained in the surface water samples. In addition, please note if the samples collected from the drainage ditches were collected from the downstream to up-stream direction.
6. Page 4-6, Section 4.2, Monitoring Well Installation and Groundwater Sampling, 2008 CMS Investigation, Bullet #4: As per Figure 4-1, please revise the text to state that sample 61SB05 is in the “northern” portion of the site instead of “northwestern”.
7. Page 4-7, Section 4.2, Monitoring Well Installation and Groundwater Sampling 2008 CMS Investigation, Paragraph 2: Please provide the rationale for allowing such a limited timeframe between well installation, development and sampling in this and future documentation. Specifically, the technical argument for allowing a short timeframe between these activities was outlined in the Navy’s response to PREQB’s evaluation of the response to comments on the SMWU 80 Revised Final RFI Work Plan. Please include a summary of this information in the text, along with the pertinent field measurements and observations that support the short timeframe between well installation, development and sampling.

8. Page 4-8, Section 4.2, Paragraph 2: Please clarify the second statement in the paragraph which states, "A minimum of three well volumes were bailed from each of the newly installed wells meeting the development criteria."
9. Page 4-10, Section 4.4.2.1, Sediment Sampling PFO3 Wetland: Please include VOCs in the list of analytical parameters for wetland sediment samples, as per Table 4-2.
10. Page 4-15, Section 4.9.3, Matrix Spike/Matrix Spike Duplicates, 2010 Additional Sampling Investigation: Revise the text to include surface water MS/MSD samples.
11. Figure 4-1:
  - a. Please indicate the direction of groundwater flow on this figure.
  - b. Please show the locations from which background sediment samples were collected. If the samples were not collected from within the area covered by this figure, please add a figure to show the background locations.
  - c. Please revise to include sediment sample 61SD35 or clarify where on the figure this sample is located.
  - d. In the field log book notes (Adam Gailey February 2010) in Appendix A, the location of sample 61SB29 is north of 61SB30. This figure shows 61SB29 to the west of 61SB30. Please clarify.
  - e. In the field log book notes (Adam Gailey February 2010) in Appendix A, the location of sample 61SW08 is different than located on this figure. Please clarify.
12. Table 4-2:
  - a. Please note in the comment column those samples that were re-collected as part of the 2010 sampling event due to rejection of the initial data.
  - b. Please note "duplicate" in the comment column for subsurface soil sample 61SB32-01D.
13. Page 5-3, Section 5.2.1, Paragraph 2: Please clarify whether other information exists that supports the presence of a former drainage system in addition to the presence of brown silt and clay. Also, please edit "steam" to "stream" in the third sentence of the first full paragraph on this page.
14. Page 5-4, Section 5.2.3, Paragraph 4: Please comment on the validity of the slug test results given that the slug tests were performed on the same day as the ground water sampling for several of the wells.
15. Page 6-2, Section 6.1, Surface Soil: Please revise the text to note that methylene chloride is also a common lab contaminant. In addition, please clarify if sodium bisulfate was used to preserve the soil samples for VOCs as this preservative can also cause acetone contamination.
16. Page 6-3, Section 6.2, Subsurface Soil, Last Paragraph:
  - a. Revise the Base background screening value for arsenic from 15.9 mg/kg to 1.59 mg/kg.

- b. Revise the sample ID 61SB04-01 to 61SB40-01.
- c. Revise the sample ID 61SB12-02 to 61SB21-02.

17. Page 6-4, Section 6.3:

- a. Although current groundwater data is representative of current conditions to which receptors may be exposed, past groundwater data is useful in evaluating trends, to aid in estimating future groundwater quality. Please discuss trends observed (i.e., are concentrations steady state or decreasing/increasing?). This comment also applies to Section 8.3.1.1.
- b. Additional information is needed to support the assumption that benzene and trichloroethylene impacts identified at SWMU 61 are attributable to upgradient SWMUs. If groundwater contamination above ARARs is attributable to SWMU 54, is the Navy proposing to include groundwater at SWMU 61 as part of SWMU 54?
  - i. Please add a figure that shows isocontours for each contaminant identified in groundwater in excess of screening criteria. Please include SWMU 54 on this figure (include groundwater concentrations at SWMU 54 wells at downgradient edge of SWMU 54 upgradient from SWMU 61). This will aid in evaluating whether VOC detections are part of the SWMU 54 plume.
- c. Paragraph 3: Please change the word “form” to “from” in the fourth sentence.

18. Page 6-5, Section 6.4.1: Please clarify why these wetland samples were not analyzed for VOCs, when it is documented in the report that VOC-impacted groundwater discharges to the surrounding wetland.

19. Page 6-8, Section 6.5.1: Please discuss why sediment samples 61SD10 through 61SD29 were not analyzed for VOCs.

20. Page 6-9, Section 6.5.1, PEM1B Sediment:

- a. Revise the sample ID 21SD28 to 61SD28.
- b. Revise the text to note that lead was detected above the base background screening value in 29 sediment samples and three duplicates.

21. Page 6-10, Section 6.5.2, PFO3 Sediment:

- a. Paragraph 1: Please revise the text to note that methylene chloride is also a common lab contaminant. In addition, please clarify if sodium bisulfate was used to preserve the soil samples for VOCs as this preservative can also cause acetone contamination.
- b. Last Paragraph: Revise the text to state that “nine” metals were detected at concentrations exceeding background screening values instead of “ten”.

22. Page 6-11, Section 6.5.2, PFO3 Sediment: Revise the text to state that TOC concentrations ranged from 29,000 mg/kg to 87,000 mg/kg (instead of 230,000 mg/kg), as per Table 6-12.

23. Page 6-11, Section 6.5.3: Results from the wetland reference were not included for sample 61BGFWS16 as elevated arsenic and zinc concentrations were detected at this location. Please identify the criteria used to identify that these concentrations were elevated (i.e., was an outlier analysis conducted of all sediment samples?). If an outlier analyses was not conducted, please discuss how the remaining samples were evaluated to determine if elevated concentrations were present in these samples.
24. Page 6-12, Section 6.6.1, Summary of Detected Compounds in Field QA/QC Samples: Revise the reference to "Table 6-15" to "Table 6-17".
25. Page 6-14, Section 6.6.2, Validation Summary:
- a. The final paragraph on this page is a repeat of paragraph 6. Please delete the repeat text in the final paragraph.
  - b. Include a discussion on the elevated reporting limits for SVOCs in many PEM1B and PFO3 sediment samples and subsurface soil samples and how the elevated reporting limits affect the achievement of project objectives (i.e., comparison to cleanup standards, characterization of nature and extent, risk assessment).
26. Page 6-15, Section 6.6.2, Validation Summary: Paragraph 3 states that the data that were rejected during validation were not chemicals of potential concern (COPCs) for SWMU 61. However:
- a. Results for nickel, lead and zinc were rejected in surface soil samples 61SB09-00 and 61SB27-00. Per page 7-33, these metals are ecological COPCs in surface soil;
  - b. Results for arsenic, chromium and cobalt were rejected in subsurface soil samples 61SB10-05 and 61SB32-01. Per page 7-34, chromium and cobalt are ecological COPCs in subsurface soil. Per page 8-7, arsenic and cobalt are total soil human health COPCs.
  - c. Results for barium, cobalt, copper, lead, vanadium and zinc were rejected in PEM1B wetland surface water samples 61SWPEM-10, 61SWPEM-12, 61SWPEM-14, 61SWPEM-15, 61SWPEM-24, 61SWPEM-34, and 61SWPEM-35. Per page 7-37, barium, cobalt, copper, lead, vanadium and zinc are ecological COPCs for the PEM1B wetland surface water. Per page 8-8, barium, cobalt, copper, lead and vanadium are human health COPCs for the PEM1B wetland surface water.
  - d. Results for total and dissolved cobalt were rejected in groundwater sample 61GW03. Per page 7-35, cobalt is an ecological COPC in groundwater. Per page 8-8, total and dissolved cobalt are a human health COPC in groundwater.
  - e. Results for all nondetect results (organic and inorganic) were rejected in sediment samples 61SD12 and 61SD15. Several of these rejected results are ecological COPCs in the PEM1B wetland sediment.
- Please clarify the apparent discrepancy and discuss the impact of rejected data on achieving data quality objectives.
27. Page 7-9, Section 7.2: The report states that soil samples collected from 1 to 3 foot depth interval were quantitatively evaluated in the SERA. Please identify the

complete exposure pathways and representative ecological receptors expected to be exposed to this soil depth range.

28. Page 7-14, Section 7.3.2.1: Upper trophic level receptors selected for the wetland habitats present immediately adjacent to SWMU 61 include the spotted sandpiper (avian invertivore) and the green heron (avian piscivore). It would appear that a complete exposure pathway exists from sediment to aquatic invertebrates to insectivorous bats as these mammals would forage for emerging insects above the wetlands (particularly the PEM wetland community). Please include an insectivorous bat as a receptor species in the SERA or provide justification why a mammalian insectivore should not be evaluated in the SERA.
29. Page 7-29, Section 7.5.2.2.1: The discussion regarding calculation of aquatic invertebrate tissue concentrations should indicate that these concentrations were determined from sediment concentrations of contaminants – not soil concentrations. Please correct the text.
30. Page 7-47, Section 7.9: The body-weight adjusted toxicity reference values presented in the table for MATCs and LOAELs for pyrene and selenium are incorrect as the MATC values exceed the LOAEL values. Please correct.
31. Page 7-48, Section 7.9: The mean water hardness of the PEM wetland is reported to be 258 mg/L CaCO<sub>3</sub>. A review of the surface water data presented in Table 6-8 for the PEM wetland does not support the value of 258 mg/L. Please discuss what samples were specifically used to calculate the mean water hardness values of the PEM and PFO wetland surface water samples. Note that results for some of the magnesium values were rejected and could not be used in the SERA. Verify that these calculations and revise the surface water screening values appropriately as well as the subsequent discussion as necessary.
32. Page 7-68, Section 7.9.1.3: The mean water hardness of the PEM wetland is reported to be 258 mg/L CaCO<sub>3</sub> for water hardness dependent metals of concern in groundwater (cadmium, copper, lead and zinc). Please see the comment on page 7-48 regarding the water hardness of the PEM wetland surface water samples. Revise the discussion regarding the surface water screening values for these metals and conclusions as necessary.
33. Page 7-84, Section 7.9.1.5: The last paragraph of this section correctly indicates that cadmium presents an ecological risk and is recommended for further evaluation. However, further on in this paragraph, cadmium is erroneously included with other COPCs that do not require further evaluation. Please delete this second reference to cadmium as additional evaluation is warranted.
34. Page 7-88, Section 7.9.1.6: The mean water hardness of the PEM wetland is reported to be 258 mg/L CaCO<sub>3</sub> for water hardness dependent metals of concern in PEM surface water samples (cadmium, chromium, copper, lead and zinc). Please see the

comment on page 7-48 regarding the water hardness of the PEM wetland surface water samples. Please revise the discussion regarding the surface water screening values for these metals and conclusions as necessary.

35. Page 7-118, Section 7.9.3.5: This section identifies barium as an ecological COC for the PFO sediment while copper, lead and mercury are identified as metals that require further evaluation to determine their source to the wetland. Please add cadmium and zinc as metals requiring further evaluation as these metals present a potential risk and were elevated with respect to background sediment concentrations.
36. Page 8-1, Section 8.0: Please address mutagenic mode of action chemicals in the human health risk assessment (HHRA).
37. Page 8-5, Section 8.3.1.2.1: Please clarify why a discussion of background is included in this section when a comparison to background is not appropriate for COPC selection. For COPC selection, a comparison to risk based screening criteria is conducted to identify those chemicals retained for quantitative evaluation in the HHRA. During risk characterization, the contribution to site risks from inorganics attributable to background is discussed. Please remove comparisons to background from all dataset discussions in this section.
38. Page 8-6, Section 8.3.1.2.2: Please also describe the natural processes likely to be occurring at the site that may influence the oxidation state of chromium as further justification for the use of the less toxic trivalent chromium screening criteria. As a conservative measure, PREQB prefers the use of the hexavalent screening criteria but will defer to EPA.
39. Page 8-9, Section 8.3.1.2.3: Please clarify how elevated detection limits were considered in the COPC selection process. Were detection limits higher than the maximum detected concentration used for screening purposes? Were chemicals excluded from the HHRA that had detection limits above screening criteria? Please also add a discussion of how elevated detection limits were evaluated in Section 8.3.2.4, Data Analysis.
40. Page 8-12, Section 8.3.2.1: Please clarify what criteria were used to determine that the concentrations of VOCs were "very low".
41. Page 8-14, Section 8.3.2.4: Please clarify whether only groundwater data from wells in the source area were used in calculating exposure point concentrations (EPCs) or whether data from all wells, even if outside the groundwater plume for a specific COPC, were used in calculating the EPC. As a private well could be installed at any location at the site, the use of only those wells within the source area is requested to ensure that risks would be quantified for such exposure.
42. Page 8-17, Section 8.3.2.5, Adult and Child Residents:

- a. As a conservative measure and for consistency with evaluations done at other sites in Puerto Rico, PREQB prefers that child exposure to vapors via inhalation while bathing be evaluated, as vapors accumulate in the bathroom. However, PREQB will defer to EPA on this issue.
  - b. Please provide the Johnson and Ettinger spreadsheets documenting the vapor intrusion modeling so agency review of the modeling can be conducted.
43. Table 4-1, Page 2 of 2, Row #2: Please include VOCs in the list of analytical parameters for wetland sediment samples, as per Table 4-2.
44. Table 4-2:
- a. Please note in the comment column those samples that were re-collected as part of the 2010 sampling event due to rejection of the initial data.
  - b. Please note "duplicate" in the comment column for subsurface soil sample 61SB32-01D.
  - c. Surface soil sample 61SB27-00 shows a sample date of 2/18/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 2/17/10. Please revise.
  - d. Surface soil samples 61SB32-00, 61SB33-00, 61SB34-00, and 61SB35-00 show a sample date of 2/19/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 2/18/10. Please revise.
  - e. The table shows a subsurface soil sample collected at 3-5 feet bgs at location 61SB01; the field log book notes confirm this depth interval. However, the boring log for this location shows that the sample was collected at 9-11 feet bgs and not 3-5 feet bgs. Please clarify.
  - f. The table shows a subsurface soil sample collected at 1-3 feet bgs at location 61SB10; the field log book notes confirm this depth interval. However, the boring log for this location shows that the sample was collected at 3-5 feet bgs and not 1-3 feet bgs. Please clarify.
  - g. The table shows a subsurface soil sample collected at 1-3 feet bgs at location 61SB11; the field log book notes confirm this depth interval. However, the boring log for this location shows that the sample was collected at 3-5 feet bgs and not 1-3 feet bgs. Please clarify.
  - h. The table shows a subsurface soil sample collected at 1-3 feet bgs at location 61SB12; the field log book notes confirm this depth interval. However, the boring log for this location shows that the sample was collected at 3-5 feet bgs and not 1-3 feet bgs. Please clarify.
  - i. The table shows a subsurface soil sample collected at 3-5 feet bgs at location 61SB19; the field log book notes confirm this depth interval. However, the boring log for this location shows that the sample was collected at 5-7 feet bgs and not 3-5 feet bgs. Please clarify.
  - j. 2010 subsurface soil samples 61SB03-01, 61SB09-01, 61SB13-01, and 61SB16-01 show a sample date of 2/24/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 2/23/10. Please revise.
  - k. Per the March 2010 SWMU 61 Request for Additional Sampling, samples were to be collected at each soil boring from 1-3 feet bgs and 9-11 feet bgs or to just

above the groundwater table unless field screening indicates a different interval displaying contamination.

- i. Please clarify why samples were only collected from one depth interval (1-3 feet bgs) in samples 61SB23 through 61SB33 and samples 61SB35 through 61SB45.
  - ii. Please clarify why a sample was not collected just above groundwater (5-7 ft bgs) in borings 61SB21 and 61SB22.
  - iii. Page 43 of the field logbook notes by Robert Roselius in Appendix A state that a sample will also be collected from 3-5 feet bgs at location 61SB35. Please clarify why this was not collected.
- l. 2010 subsurface soil sample 61SB27-01 shows a sample date of 2/18/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 2/17/10. Please revise.
  - m. 2010 subsurface soil samples 61SB36-01 and 61SB37-01 show a sample date of 2/18/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 2/19/10. Please revise.
  - n. 2010 subsurface soil samples 61SB43-01, 61SB44-01, and 61SB45-01 show a sample date of 2/22/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 2/23/10. Please revise.
  - o. The depth for forested wetland sediment sample is noted on the table as 0-0.25 feet bgs. However, the field notes for this sample show a sample depth of 0-6 inches. Please clarify.

45. Table 6-11 and 6-14: Please include the sample depths for the 2008 sediment samples.

46. Tables 8-1 and 8-2: Please state the rationale for selected EPC value in Table 1 rather than requiring the reader to refer to Table 2 for the rationale.

47. Tables 8-1 through 8-7:

- a. Please update the RSLs to the November 2010 version.
- b. For clarity, as the Navy has chosen to present tables that differ from the RAGS D Tables, please include a column that provides the range of detection limits, consistent with RAGS Part D guidance (Table 2).

#### **Appendix A, Field Activities**

1. Field Log Book Notes: The well development notes (Mike Cromley) for 2008 groundwater samples 61GW04 and 61GW05 were missing the date performed. Please include this information.

2. 2010 Groundwater Sampling Forms:

- a. There were no groundwater sample log forms provided for samples 61GW30 and 61GW36 collected on 2/24/10. Please provide.
- b. 61GW01, 61GW02, 61GW05:

- i. Please explain why the total depth listed is significantly different than that listed on the 2008 boring log.
- c. 61GW01: Please explain why the pump intake was set at 15 feet which is outside the screened interval of 4-14 feet.
- d. 61GW02: Please explain why the pump intake was set at 19 feet which is outside the screened interval of 7.5-17.5 feet.
- e. 61GW03: The total depth measured in the field was 9.73 feet which is significantly less than the total depth on the 2008 boring log of 22 feet. Please explain the difference and explain if this well was redeveloped based on this difference.
- f. 61GW03: Please explain why the pump intake was set at 7.5 feet which is outside the screened interval of 12-22 feet.
- g. 61GW05, 61GW06, 61GW21, 61GW22, 61GW23, 61GW24, 61GW27, and 61GW37: As per Section IV of the EPA Region 2 Low Flow SOP (which was also included in the SWMU 61 2007 Work Plan), the pump intake is generally set at the midpoint of the most permeable zone in the screened interval. Please explain why this procedure was not used in these wells and how the pump intake depths were determined.

#### **Appendix C, Data Validation Report Summaries**

1. SDGs NAPR55121-1, NAPR55121-2, NAPR55183-1, NAPR55257-2: In this SDG, results were rejected due to MS/MSD recoveries below 10%. PREQB agrees with this qualification approach. However, this was not performed in previous SDGs (SWMU37299-1, SWMU37369-1, SWMU37406-1, SWMU37634-1, SWMU37613-1). Please explain why a consistent approach was not used in all SDGs during data validation.
2. SDG NAPR55183-1: The SVOC analyses of samples 61SD19 and 61SDFW03 yielded low recoveries of one internal standard. Please clarify in the validation report if these samples were reanalyzed by the laboratory.
3. SDG NAPR55183-2: The SVOC analysis of sample 61SD27 yielded low recoveries of one internal standard. Please clarify in the validation report if this sample was reanalyzed by the laboratory.
4. SDG NAPR55222-1: The VOC and SVOC analyses of several samples yielded low recoveries of internal standards. Please clarify in the validation report if these samples were reanalyzed by the laboratory.
5. SDG NAPR55257-1: The SVOC analyses of samples 61SDFW08, 61SB41-00 and 61SB42-00 yielded low recoveries of one internal standard. Please clarify in the validation report if these samples were reanalyzed by the laboratory.

6. SDG NAPR55257-2: The SVOC analysis of sample 61SW08 yielded low recoveries of one internal standard. Please clarify in the validation report if this sample was reanalyzed by the laboratory.
7. SDG NAPR55257-3: The SVOC analysis of sample 61GW06 yielded low recoveries of one internal standard. Please clarify in the validation report if this sample was reanalyzed by the laboratory.
8. SDG NAPR55330: The SVOC analysis of sample 61SB43-00 yielded low recoveries of one internal standard. Please clarify in the validation report if this sample was reanalyzed by the laboratory.