



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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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

SWMU 74 (Pipelines in Fueling Piers Area) – draft Phase II Investigation and Corrective  
Measures Study Report, dated August 16, 2011

AOC E (Pineros and Cabeza de Perro Islands) – draft Phase I RCRA Facility  
Investigation Report, Terrestrial Investigation, dated September 2010

AOC F (MNA Sites) – Draft Remedial Approach Evaluation for Site 520, dated  
November 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 74 (Pipelines in Fueling Piers Area) – draft Phase II Investigation and Corrective  
Measures Study Report

EPA has completed its review of the draft Phase II Investigation and Corrective Measures Study  
Report (the Report) submitted by Mr. Mark Kimes' (of Michael Baker Inc.) letter of August 16,  
2011, on behalf of the Navy. As part of that review EPA requested that our consultant, TechLaw  
Inc, also review the Report. TechLaw's comments are given in the enclosed Technical Review,  
dated November 3, 2011 (Enclosure #1). Based on those reviews, EPA has determined that the  
Phase II Investigation and CMS Report for Pipelines in the Fueling Piers Area are not fully  
acceptable. EPA's primary concerns include:

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1) Total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO) were detected in four surface soil locations at concentrations exceeding Puerto Rico Environmental Quality Board's TPH action level of 100 mg/kg, all located at the Pier #3 Area (refer to Figure 6-1 of the CMS). However, the potential risk posed by these TPH exceedances was not quantified in the Human health risk assessment (HHRA), since as indicated in Section 8.0 of the CMS, there are no federal-promulgated toxicity criteria for TPH. EPA notes that surface soil TPH DRO and TPH GRO concentrations range up to 410 mg/kg and 2,500 mg/kg, respectively. Therefore, EPA recommends that further evaluation of the risk posed by TPH in surface soils at Pier 3 is warranted.

Possible options for assessment of TPH risk/hazard include the Massachusetts Department of Environmental Protection (MADEP) Volatile Petroleum Hydrocarbons (VPH)/Extractable Petroleum Hydrocarbons (EPH) methodology, the Total Petroleum Hydrocarbon Criteria Work Group (TPHCWG) methodologies following the American Standard Test Method (ASTM) Risk-based Corrective Action (RBCA) paradigm, various state guidance documents available from the States of Ohio and Washington, or the Indiana Risk Integrated System of Closure (RISC). The latter program has developed DRO- and GRO-specific screening criteria for direct contact with soil under commercial/industrial and residential land use. The RISC criteria for GRO in soil under residential/industrial land use is 25/330 mg/kg. The RISC criteria for DRO under residential/industrial land use is 80/1000 mg/kg. If fractional analyses data are available, EPA recommends the Navy consider utilizing the MADEP VPH/EPH guidance for TPH risk/hazard assessment at SWMU 74. This guidance may be accessed at: <http://www.mass.gov/dep/cleanup/laws/policies.htm>.

EPA requests that the Navy revise the Report to assess the risk/hazard potential to site receptors posed by TPH, or alternatively, propose usage of the Puerto Rico Environmental Quality Board's TPH action level of 100 mg/kg as the corrective action objective (CAO) for TPH applicable to SWMU 74.

2) In Section 8.0 of the CMS (Human health risk assessment and Development of CAOs), it is stated, "Exposure to groundwater via ingestion, dermal contact, or inhalation (volatiles in groundwater emitted through soil into buildings, into a trench, or while showering) at the Fueling Piers Area was considered a potentially complete but insignificant exposure pathway because groundwater was determined to be impacted by releases from SWMU 7/8 (Tow Way Fuel Farm)...", and is to be addressed under the proposed final remedy for SWMU 7/8. The section concludes "therefore, exposure to groundwater, either directly or indirectly, was not evaluated in this HHRA." EPA has the following comment on this:

First, while no PAHs were reportedly detected in groundwater at SWMU 74 (from the single groundwater well and noting that low-level PAHs were the only chemicals sampled), a PAH was detected above its EPA Regional Screening Level (RSL) in the 2008 Phase I investigations. In addition, the reporting limits for the groundwater sample collected in 2011, as presented in Appendix B, are an order of magnitude (or more) greater than the RSL for tap water for several PAHs. The HHRA should be revised to quantify risk and hazard for any groundwater

constituent of potential concern (COPCs) identified in 2008 (as data from 2008 are currently incorporated in the HHRA soil data sets). Frequency of detection (FOD) should not be used to eliminate any COPC from the quantitative HHRA. The HHRA should also clarify whether sample quantitation limits (SQLs) rather than reporting limits were low enough to meet EPA tap water RSLs for PAHs. If SQLs were not sufficient to meet EPA tap water RSLs, this is a data gap that should be addressed in the revised HHRA, and/or addressed as part of SWMU 7/8. The SWMU 74 HHRA and/or SWMU 7/8 forthcoming HHRA should be revised to qualitatively address this apparent data gap and justify that PAHs are not currently present in groundwater at SWMU 74.

Secondly, Section 8.3.6, Sources of Uncertainty, should be revised to clarify that the cumulative risk and hazard estimates presented in the current HHRA may be underestimated at this time, and to clarify how the SWMU 7/8 HHRA conclusions will impact the SWMU 74 HHRA conclusions. For example, if a qualitative CAO is determined for SWMU 7/8 to restrict residential development due in part to groundwater exposures, the same qualitative corrective action objective (CAO) should be considered for SWMU 74. Or, alternatively, the groundwater risk and hazard estimates at SWMU 7/8 may be added to the soil risk and hazard estimates at SWMU 74 to determine estimated cumulative risk and hazard values at SWMU 74, for the purposes of determining if a qualitative and/or quantitative CAO at SWMU 74 is appropriate.

Also, please submit a water table contour map and plume map showing groundwater elevations and PAH concentrations measured in the groundwater at both the SWMU 74 Fueling Pier area and the adjacent Tow Way Fuel Farm (SWMU 7/8) area. EPA also recommends that the Navy include with the Report a cross-section showing the relationship of contaminants in the groundwater at SWMU 7/8 and the groundwater at SWMU 74 Fueling Pier area.

3) It is not possible to independently verify the Hazard Quotients (HQs) for wildlife receptors presented in Table 7-22 to 7-24 of the Screening Level Ecological Risk Assessment (SLERA), because the Report does not provide the estimated daily doses used to calculate these HQs. EPA requests that the Navy include the food chain model tables in the revised CMS report. Since it has been a recurring issue (EPA's ability to independently verify the wildlife HQ calculations), which was already observed (and commented on) during previous reviews of CMS reports at NAPR, EPA requests that the Navy include all the wildlife exposure calculation tables in the revised CMS, and all future CMS Reports for NAPR. Please note, the CMS report already includes this type of information for the human health risk assessment (see Appendix K: risk calculation spreadsheets).

Within 60 days of your receipt of this letter, please submit a revised Report which addresses the above comments and the comments in Enclosure #1.

In addition, the Puerto Rico Environmental Quality Board (PREQB) in its letter of November 2, 2011 to myself, submitted comments on the Phase II Investigation and CMS Report. PREQB's letter is included as Enclosure #2. Within 60 days of your receipt of this letter, please also submit a revised Report that addresses the enclosed PREQB comments.

AOC E (Pinosos and Cabeza de Perro Islands) – draft Phase I RCRA Facility Investigation Report, Terrestrial Investigation

EPA has completed its review of the draft Phase I RFI report on Terrestrial Investigations submitted on behalf of the Navy by Mr. Thomas Roth's (of CH2MHill) letter of September 20, 2010. As part of that review EPA requested that our consultant, TechLaw Inc, also review the above document. TechLaw's comments are given in the enclosed Technical Review, dated November 3, 2011 (Enclosure #3).

EPA notes especially the following concerns:

1) Section 1 of the Phase I RFI Report provides the location, physical description, and history of the two adjacent islands (i.e., Piñeros and Cabeza de Perro Islands) which are included under Area of Concern (AOC) E, as defined in the 2007 Consent Order. Yet, all of the sampling activities described in the Phase I RFI report have occurred exclusively in and around Piñeros Island. Amend the report to clarify the rationale for not obtaining sampling data from Cabeza de Perro Island, and discuss how the absence of analytical data from Cabeza de Perro affects the overall risk conclusions, both for human health and ecological risks, as regards AOC E.

2) Section 1.5 (Future Land Use Evaluation) states: "The Phase I RFI approach was developed by identifying areas that are currently being accessed by the public and by evaluating areas that could potentially be used in the future [by the public]". This description shows that the locations sampled during the Phase I activities were selected exclusively based on concerns for human exposures. Figure 2.1 in the RFI Report shows that the sampling locations are mainly concentrated along a path going from South Beach to Northeast Beach. The Phase I RFI report does not explain how these human health-driven sampling locations are acceptable to represent exposures that may be experienced by ecological receptors throughout the island. At a minimum, discuss this issue in the uncertainty analysis of the SLERA.

3) The nature and extent of certain contaminants in the soils has not been adequately defined in several areas, including:

Arsenic and chromium and several PAHs in the South Bunker Trail area, and the North Bunker Trail area;

Several pesticides (4,4'DDT, 4,4'DDE, dieldrin, endrin, and gamma-BHC (lindane)) in the Helicopter Landing Pad area.

4) The maximum and average concentrations for 4,4'DDT, 4,4'DDE, dieldrin, endrin, and gamma-BHC (lindane) exceed their ecological screening values (ESVs) at the Former Helicopter Landing Pad. These organochlorine pesticides exceeded their ESVs by a factor of two (4,4'DDE) to almost 40 (gamma-BHC). Such exceedances warrant further investigation, particularly in light of the small data set (n = 2) and the lack of adequate sampling to define the nature and extent of the indicated pesticide contamination. Even though these chemicals may

have resulted from intended historic uses, as opposed to disposal, it does not negate the fact that they are present at levels of concern. EPA Policy is that pesticides applied to the soil in conjunction with their intended usage, may be considered a solid waste under RCRA once the site is being remediated (refer to EPA Assistant Administrator Mathy Stanislaus letter of March 4, 2011 to Congresswoman Lynn Jenkins in regards to the Kansas Army Ammunition Plant in Parsons, KS). Revise the conclusion of the SLERA (Section 4.2) as well as the Conclusions and Recommendation Section (Section 5.0) to state that these five compounds are present at levels exceeding their ESVs and that further investigation is warranted to characterize the nature and extent of the pesticides at the Former Helicopter Landing Pad.

Within seventy five (75) days of your receipt of this letter, please submit a revised Phase I RFI report which addresses the above comments and the comments in Enclosure #3.

In addition, the Puerto Rico Environmental Quality Board (PREQB) in its letter of November 8, 2010 to myself, submitted comments on the Phase II Investigation and CMS Report. PREQB's letter is included as Enclosure #4. Within 75 days of your receipt of this letter, please also submit a revised report that addresses the enclosed PREQB comments.

#### AOC F (MNA Sites) – Draft Remedial Approach Evaluation for Site 520

EPA has completed its review of the above document submitted by Mr. Mark Kimes' (of Michael Baker Inc.) letter of November 22, 2011, on behalf of the Navy. EPA has determined that the document as submitted does not constitute a complete work plan, since not all activities to be implemented are adequately described. For example, in Section 3.3.1 (Scoring and Discussion) under the discussion regarding Excavation, it is stated "Excavation will be coupled with chemical oxidant application to address remnant dissolved-phase contaminant in groundwater. The oxidant would be applied on the floor of the open excavation." Yet, the document never discusses this further, including what oxidant will be used, the quantity of oxidant to be applied, and whether groundwater is expected to be present at the floor of the open excavation. Likewise, no details of the proposed excavation are given, such as the depth, horizontal limits, how the excavated soils will be managed, etc."

Also, a statement is made in Section 3.3.1 (Scoring and Discussion) under the discussion regarding Excavation, that "Additional site-specific data would be required to properly implement excavation." It appears that the additional delineation proposed consists of the soil boring program around well 520MW02 that is discussed under Section 4.3 (LNAPL Delineation). Since data from this additional delineation will be utilized to define the extent of LNAPL contaminated soils to be excavated, please advise when and how the final determination of the extent and volume of the LNAPL contaminated soils to be excavated will be made.

EPA will conditionally concur with the approach outlined in the above document, provided it is recognized that implementation of the work described in the document does not necessarily constitute completion of a final remedy for this site. Prior to giving our full approval, EPA requests that, within forty five (45) days of your receipt of this letter, the Navy submit as an Addendum to the document, the following:

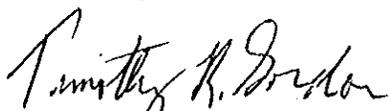
- 1) A discussion of the proposed oxidant and the procedures to be followed in applying it at the floor of the open excavation;
- 2) A discussion of how the "fill material" to close the open excavation will be selected and screened to insure that it is not contaminated, and when that backfill material will be applied (immediately after applying the oxidant, or later, etc.); and
- 3) a schedule for implementing all activities described in the document, including the installing and evaluating delineation soil borings; implementing the soil excavation and disposal of the excavated soils and treatment of the soils prior to disposal if necessary; applying the oxidant; backfilling the excavation; and reporting the results of all the activities to EPA and PREQB.

Extension requests for submittal of certain documents

EPA will approve the extension requests for submittal of 14 documents, as requested by your letter of December 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

Enclosures (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. Mark Kimes, Baker Environmental, w/encls.  
Mr. Stacin Martin, US Navy, w/encls.  
Thomas Roth, CH2MHill, w/encls. #3 & 4 only  
Ms. Cathy Dare, TechLaw Inc, w/encls.  
Mr. Felix Lopez, USF&WS, w/o encls.

ENCLOSURE # 1

**TECHNICAL REVIEW OF THE  
DRAFT PHASE II INVESTIGATION AND CORRECTIVE MEASURES STUDY  
REPORT – SWMU 74 – FUELING PIERS AREA  
DATED AUGUST 16, 2011**

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

**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**

<b>EPA Task Order No.</b>	<b>002</b>
<b>Contract No.</b>	<b>EP-W-07-018</b>
<b>TechLaw TOM</b>	<b>Cathy Dare</b>
<b>Telephone No.</b>	<b>315-334-3140</b>
<b>EPA TOPO</b>	<b>Timothy Gordon</b>
<b>Telephone No.</b>	<b>212-637-4167</b>

**November 3, 2011**

**TECHNICAL REVIEW OF THE  
DRAFT PHASE II INVESTIGATION AND CORRECTIVE MEASURES STUDY  
REPORT – SWMU 74 – FUELING PIERS AREA  
DATED AUGUST 16, 2011**

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

The following comments were generated based on review of the August 16, 2011 *Draft Phase II Investigation and Corrective Measures Study Report – SWMU 74 – Fueling Piers Area, Naval Activity Puerto Rico, Ceiba, Puerto Rico* (CMS Report).

**GENERAL COMMENTS**

1. The text states in Section 6.1 Surface Soil, Page 6-1, that, “[t]he highest area of TPH-impacted surface soil (2,790 J mg/kg at boring 74SB748 as shown on Figure 6-1) is located beneath an asphalt surface thereby eliminating any associated direct contact exposure pathways. Since the risk assessment assessed only surface and subsurface soil not overlain by an encapsulating layer (i.e., buildings or asphalt surface), the risk assessment was heavily weighted toward current conditions and does not assess future potential exposures associated with surface soil (or subsurface soil, where uncharacterized). To support defensible site and risk management decisions, the implementation of legally-enforceable and transferable, area-specific land use or institutional controls (LUC/ICs) will be necessary to ensure these impermeable layers are maintained in perpetuity, effectively precluding direct and indirect contact. Additional characterization of underlying soils may also be conducted in an effort to reduce associated uncertainty and potentially refute the default assumption that covered soils are contaminated. If historical sampling was biased such that the extent of contamination beneath the hard surfaces is unknown, revise the Report so that these required LUC/ICs are incorporated into the proposed alternatives.
  
2. The text in Section 5.2, Area Geology and Hydrogeology on Page 5-2 indicates that groundwater is present at approximately 8 feet below ground surface (bgs) and is likely influenced by the Ensenada Honda. However, no formal testing was performed during the Phase I/Phase II CMS Investigations to ascertain the porosity and interconnectivity to the surface water, including tidal influence and salinity. It is stated in the Final CMS Work Plan SWMU 74 (Work Plan) that no investigation of the surface water will be performed; however due to the nature of the proposed remedy (no further action), the contribution of potential groundwater-to-surface water discharge should be evaluated and discussed to address all potential pathways. Further, a groundwater table elevation contour map was not developed due to the spatial distribution of existing monitoring wells within the Fueling Piers Area, even though groundwater is anticipated to flow west-southwest towards the Ensenada Honda. This appears to be a significant data gap given that the currently proposed corrective measure is no further action. Revise the CMS Report to present data that supports a fully developed conceptual site model (CSM) to substantiate the currently proposed remedial action.

Also, Section 9, Summary of COCs and CAOs indicates that there were no exceedances of risk-based standards in groundwater that were positively correlated to Total Petroleum Hydrocarbon (TPH), indicating that the presence of compounds in groundwater is not the result of a release from SWMU 74. Consequently, groundwater was not further evaluated as part of the risk assessments. It should be noted that this conclusion was not presented in the Final Phase I Corrective Measures Study Investigation for SWMU 74 (Phase I CMS Report). Further, the reporting limits for the groundwater sample collected in 2011, as presented in Appendix B, are an order of magnitude (or more) greater than the Regional Screening Level (RSL) for tap water for several polynuclear aromatic hydrocarbons (PAHs). Therefore, the CMS Report does not substantiate that the compounds detected in groundwater are not the result of a release from SWMU 74. If constituents are detected above appropriate risk-based standards, the Navy is obligated to address the release once identified, whether or not a clear determination of the exact source or release pathway can be uniquely determined. Therefore, statements indicating that exceedances of risk-based standards in groundwater are not attributable to SWMU 74 should be removed and the document reassessed to quantify all contaminants of concern regardless of known origin. If groundwater contaminants will be addressed under a separate SWMU, such as SWMU 7/8, then this needs to be explained in the CMS Report. Also, as previously discussed, the potential for contaminants to migrate to surface water at SWMU 74 needs to be addressed in the CMS Report.

3. The human health risk assessment (HHRA) states, "Exposure to groundwater via ingestion, dermal contact, or inhalation (volatiles in groundwater emitted through soil into buildings, into a trench, or while showering) at the Fueling Piers Area was considered a potentially complete but insignificant exposure pathway because groundwater was determined to be impacted by a release from SWMU 7/8 (which is being addressed under SWMU 7/8) and not site-related activities specific to the Fueling Piers Area during the 2008 Phase I CMS investigation... Based on the findings of the Revised Final Phase I CMS Report, leaching of chemicals from surface soil and/or subsurface soil to groundwater represents a potentially complete, but insignificant transport pathway for the following reasons: (1) VOCs [volatile organic compounds], PAHs [polynuclear aromatic hydrocarbons], and total recoverable metals were not detected in groundwater collected at the Fueling Piers Area during the 2008 Phase I CMS field investigation above RSLs (with the exception of one low, estimated concentration of benzo[a]pyrene) and/or ULM background concentrations (Baker, 2010a); (2) no total TPH [total petroleum hydrocarbon] detections were reported above the established screening value in groundwater collected from wells located at the Fueling Piers Area (Baker 2010a); and (3) no total TPH detections were reported above the established screening value in subsurface soil collected at soil boring location 73SB231 during the 2008 Phase I CMS field investigation (boring location where potential fuel-related impacts were identified in surface soil) (Baker, 2010a)."

First, it is noted that the HHRA indicates in Section 8.3.2.2, Conceptual Site Model (CSM), that benzo(a)pyrene was the only compound that exceeded its EPA RSL during the 2008 Phase I CMS field investigation, while Section 6.3, Groundwater, indicates that benzo(a)anthracene was the only compound that exceeded its EPA RSL during the 2008 Phase I CMS field investigation. Revise the HHRA to resolve this discrepancy.

Additionally, while no PAHs were reportedly detected in groundwater at SWMU 74 (from the single groundwater well and noting that low-level PAHs were the only chemicals sampled), a PAH was detected above its EPA RSL in 2008. In addition, the reporting limits for the groundwater sample collected in 2011, as presented in Appendix B, are an order of magnitude (or more) greater than the RSL for tap water for several PAHs. The 2008 detection and the reporting limits above RSLs, combined with potential groundwater impacts at SWMU 74 from another site (SWMU 7/8), suggests that groundwater should be further evaluated in the SWMU 74 HHRA. The decision to implement a corrective action objective(s) is weighed heavily upon the *cumulative* risk and hazard results for site receptors. Currently, the SWMU 74 HHRA does not contain *cumulative* risk and hazard results across all potentially complete pathways for all receptors (i.e., inclusive of groundwater exposures). Risk and hazard estimates were calculated only for soil exposures.

The HHRA should be revised to quantify risk and hazard for the groundwater constituent of potential concern (COPCs) identified in 2008 (just as data from 2008 are currently incorporated in the HHRA soil data sets). Frequency of detection (FOD) should not be used to eliminate any COPC from the quantitative HHRA. The HHRA should also clarify whether sample quantitation limits (SQLs) rather than reporting limits were low enough to meet EPA tap water RSLs for PAHs. If SQLs were not sufficient to meet EPA tap water RSLs, this is a data gap that should be addressed in the revised HHRA, and/or addressed as part of SWMU 7/8. The SWMU 74 HHRA and/or SWMU 7/8 forthcoming HHRA should be revised to qualitatively address this apparent data gap and justify that PAHs are not currently present in groundwater at SWMU 74.

Also, Section 8.3.6, Sources of Uncertainty, should be revised to clarify that the cumulative risk and hazard estimates presented in the current HHRA may be underestimated at this time, and to clarify how the SWMU 7/8 HHRA conclusions will impact the SWMU 74 HHRA conclusions. For example, if a qualitative CAO is determined for SWMU 7/8 to restrict residential development due in part to groundwater exposures, the same qualitative corrective action objective (CAO) should be considered for SWMU 74. Or, alternatively, the groundwater risk and hazard estimates at SWMU 7/8 may be added to the soil risk and hazard estimates at SWMU 74 to determine estimated cumulative risk and hazard values at SWMU 74, for the purposes of determining if a qualitative and/or quantitative CAO at SWMU 74 is appropriate. Further, given that groundwater is anticipated to flow west-southwest towards the Ensenada Honda, clarify how surface water exposures at Ensenada Honda will be addressed in the revised HHRA. Any CAO considerations (e.g., LUCs as a qualitative CAO) moving forward should also consider Ensenada Honda.

4. It is acknowledged that volatile organic compounds (VOCs) in groundwater were not analyzed during the Phase II investigation, however, it is unclear from the HHRA if VOCs in groundwater were analyzed during the 2008 Phase I investigation. Given the nature of the site (Fueling Piers Area and location of buildings), the HHRA should be revised to clarify if volatile compounds in groundwater exceed Table 2c vapor intrusion screening criteria 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). If so, the

vapor intrusion to indoor air pathway should be fully evaluated in the HHRA in accordance with the Subsurface VI Guidance.

5. It is not possible to independently verify the wildlife Hazard Quotients (HQs) presented in Tables 7-22 to 7-24 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 Step 2 or Step 3a input parameters 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 7-15 and 7-16, respectively, but the receptor-specific EDDs are not presented. Include a separate set of tables to show the EDDs for each receptor used to derive the HQs so that the calculations can be independently verified.
6. It appears that the concentration of copper (550 mg/kg) in surface soil at sampling location 73SB758-00 and zinc (920 mg/kg) in surface soil at sampling location 74SB750-00 are outliers that might indicate two potential "hot spots" of unknown origin at SWMU 74. This possibility is not properly evaluated in the CMS Report, partly because of using linear regression analysis (see specific comment below). Figure 7-11 in the report shows that the extent of copper and zinc contamination at these two sampling locations is not fully bounded. Address this issue in Section 7.9.1.1 and discuss ways in which it can be resolved (e.g., collect several bounding samples; recalculate and compare the copper and zinc HQs by excluding the data from these two locations; "hot-spot" removal).
7. The "R" qualifier is defined in the data tables (e.g., Table 6-3) footnotes to indicate that the result has been rejected. To ensure that rejected concentrations are not used, the associated numeric values should be removed from the tables. Revise these tables to remove the numeric values associated with the rejected results.

## SPECIFIC COMMENTS

1. **Section 6.4 Linear Regression Analysis, p. 6-3.** It is not appropriate to use linear regression analysis to evaluate potential correlations between compounds detected in soil and the TPH GRO, TPH DRO, and total TPH levels to determine if their presence is site related. VOCs, PAHs and metal concentrations must be compared to screening benchmarks and NAPR background data (for metals) to evaluate ecological risk at SWMU 74. Copper and zinc in surface soil, with a 95% upper confidence limit (UCL) of the mean hazard quotient (HQ) of 3.37 and 3.44, respectively, and with concentrations exceeding background levels, were not identified as ecological COCs based on this approach. Regardless of whether these two HQs pose an ecological risk or not, statistically comparing metals results to TPH results is not a recognized Step 3.a refinement approach. Eliminate Section 6.4, as well as Table 6-7 *Summary of Linear Regression Results*, from the CMS Report. Revise the Step 3.a Risk Evaluation for Surface Soil (Section 7.9.1.1) to retain copper and zinc as ecological COCs and remove the rationale for eliminating these chemicals based on the linear regression analysis. Finally, revise the conclusions of the CMS to include copper and zinc as ecological COCs that may require further evaluation.

2. **Section 7.9 Step 3a of the BERA, first bullet, p. 7-32.** This bullet discusses using the 95% UCL of the mean chemical concentrations rather than the maximum for comparison with screening values. Specify that the 95% UCL can only be calculated for data sets having less than 70 percent non-detected results. The reference for this requirement must be provided as well. Edit the first bullet on page 7-32 to include the data set requirements for calculating the 95% UCL value.
3. **Figure 2-3 SWMU 74 Location Map Fueling Piers Area and Figure 2-4 Index Map of SWMU 74 Areas Fueling Piers Area** – The green line on the figures is not included in the legend. It is unclear what the green line represents. Identify the green line in the Figure Legends.
4. **Figure 7-11 Detected Concentrations in Surface Soil Exceeding Soil Screening Values Fuels Piers Area** – The only borings where all COCs were undetected or were found below risk-based screening levels were 74SB759 and 74SB760, in the northwest portion of the study area. All other borings in the area were found to contain concentrations of arsenic, copper, mercury, selenium, vanadium, and/or zinc that exceeded soil screening values. Therefore, the extent of arsenic, copper, mercury, selenium, vanadium, and/or zinc exceedences in the study area has not been delineated to the east, south, and west. Specifically, arsenic is not delineated to the east; copper is not delineated to the west; mercury is not delineated to the east; selenium is not delineated to the south; vanadium is not delineated to the east, south, and west; and zinc is not delineated to the east, south, and west. Revise the CMS Report to include a proposal for additional borings and samples to the east, south, and west to delineate all soil exceedences. Alternatively, provide an explanation in the CMS Report which demonstrates that additional sampling is not warranted.
5. **Figure 8-1 Detected Concentrations in Surface Soil Exceeding Residential Soil Regional Screening Levels Fueling Piers Area** – COCs with concentrations exceeding soil screening values were found in all the soil borings in this area. Therefore, COCs exceeding soil screening levels in the area are not fully delineated to the north, east, south, and west. Specifically, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, arsenic, cobalt, copper, thallium, and vanadium do not appear delineated to the north; benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, arsenic, and cobalt do not appear delineated to the east; arsenic, cobalt and vanadium do not appear delineated to the south; and benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, arsenic, cobalt, and copper do not appear delineated to the west. Revise the CMS to include a proposal for additional borings and samples to the north, east, south, and west to delineate all COCs with concentrations exceeding soil screening values. Alternatively, provide an explanation in the CMS Report which demonstrates that additional sampling is not warranted.
6. **Figure 8-2 Detected Concentrations in Total Soil Exceeding Residential Soil Regional Screening Levels** – COCs with concentrations exceeding soil screening values were found in all the soil borings in this area. Therefore, COCs exceeding soil screening levels in the area are not fully delineated to the north, east, south, and west. Specifically, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, arsenic, cobalt, copper,

thallium and vanadium do not appear delineated to the north; benzo(a)anthracene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, arsenic, cobalt and vanadium do not appear delineated to the east; benzo(a)pyrene, arsenic, cobalt, and vanadium do not appear delineated to the south; and benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, arsenic, cobalt and copper do not appear delineated to the west. Revise the CMS Report to include a proposal for additional borings and samples to the north, east, south, and west to delineate all soil exceedences. Alternatively, provide an explanation in the CMS Report which demonstrates that additional sampling is not warranted.

#### **MINOR COMMENT**

- 1. Section 7.9.1, Refined Risk Calculation, Page 7-36:** The 95% UCL NAPR background value for vanadium (259 mg/kg) is incorrect according to Table 7-20 *Summary of Descriptive and Distributional Statistics for Inorganic Ecological COCs in Surface Soil*. This value represents the Upper Limit of the Mean (ULM) for the NAPR background concentration of vanadium. The correct value is 165.70 mg/kg. Amend the text to reference the correct 95% UCL value for NAPR background for vanadium.



COMMONWEALTH OF PUERTO RICO  
Office of the Governor  
Environmental Quality Board



ENVIRONMENTAL EMERGENCIES RESPONSE AREA

November 2, 2011

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

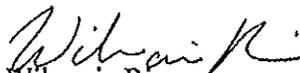
**Re: Review Draft Phase II Investigation  
and Corrective Measures Study Report  
SWMU 74 – Fuel Pipelines and Hydrants Pits  
Naval Activity Puerto Rico, Ceiba  
EPA ID No. PR2170027203**

Dear Mr. Gordon:

The Hazardous Wastes Permits Division (HWPD) and the Federal Facility Coordinator has finished the review of the Draft Phase II Investigation and Corrective Measures Study Report for SWMU 74 – Fuel Pipelines and Hydrant Pits. It was submitted by Michael Baker, Jr., Inc. on behalf of the Navy. The document was received on August 17, 2011.

Both divisions are sending joint comments in order to avoid duplicity and facilitate Navy responses. Enclosed please find PREQB's comments to the document. 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

Cruz A. Matos Environmental Agencies Building  
Ponce de León Avenue 1375, San Juan, PR 00926-2604  
PO BOX 11488, Santurce, PR 00910  
Tel. 787-767-8181 • Fax 787-767-4861

**Review Draft Phase II Investigation and Corrective Measures Study Report  
SWMU 74 – Fuel Pipelines and Hydrants Pits (August 16, 2011)  
Naval Activity Puerto Rico, Ceiba  
EPA ID No. PR2170027203**

**GENERAL COMMENTS**

1. Please address compliance with Puerto Rico's Water Quality Standards Regulation for groundwater hydraulically connected to surface water.
2. Please provide additional details regarding the pipeline. The primary potential release mechanism for the pipeline would be releases through failed joints or otherwise compromised pipe. As such, it is important to understand the diameter of the pipe and depth at which it is buried. This will allow the reader to better evaluate the adequacy of the depth(s) at which soil samples were collected. Please add this information to the discussions presented in Sections 6-1 and 6-2.
3. Please comment on the placement of the Phase II soil borings. It is understood that the goal of the Phase II was to further delineate the extent of impacts determined during Phase I, however, the boring placement appears quite widespread. For example, it was stated in the report that borings 74SB754 and 74SB755 were advanced to help evaluate impacts observed at location 74SB748. The closest of the two soil borings is approximately 40 feet from the boring location at which soil impacts were observed, while the other is located approximately 80 feet away. It is clear that there are many physical features to work around in this area, however, please mention if it is possible to gain access to the buildings to evaluate conditions closer to the pipeline.

**PAGE-SPECIFIC COMMENTS**

1. Page 6-1, Section 6-1:
  - a. Paragraph 2:
    - i. Please revise this paragraph as direct contact exposure pathways still exist for future receptors.
    - ii. Please discuss likely sources for the fuel-related contamination that is not considered related to releases from SWMU 74.
  - b. Paragraph 4: Please add samples 74SB749-00, 74SB750-00, and 74SB751-00 to the list of surface soils where low-level PAHs were prevalent. Also, include these samples in the discussion of the correlation with high TPH results in the subsequent sentence.
2. Page 6-2, Section 6.2: Please also add more discussion on the depths at which contaminants were detected above screening criteria in relation to the top and bottom depth of the fuel lines.

3. Page 6-3, Section 6.4: Please clarify why a regression analysis was conducted using surface soil data, when Section 6.1 indicates that contaminants identified in surface soil are not associated with buried fuel lines, since releases from the fuel lines would be at depth. It appears that only data from the depth of the fuel line should be evaluated. Please clarify.
4. Section 6.4 and Appendix B: The TPH GRO concentration from 74SB748 (at 2,500 mg/kg) appears to be a statistical outlier. Regression analysis should be performed for TPH GRO and Total TPH on the subset of the data set without this point to investigate whether conclusions about the correlations between TPH and other constituents remain valid.
5. Page 7-13, Section 7.3.2: The discussion of assessment endpoints omits nectivorous mammals (brown flower bat) although they have been identified in Table 7-2. Please identify in the text that nectivorous mammals represent appropriate ecological receptors that will be evaluated in the SERA.
6. Page 7-34, Section 7.9: Contaminants that exceed terrestrial plant/invertebrate screening criteria and/or a HQ of 1 based on food chain modeling are eliminated as COPCs if a significant correlation with that contaminant and DRO, GRO or TPH is not present. Additional text should be provided in the uncertainty section regarding this comparison including identifying other potential sources of these contaminants (if not fuel-related) that are elevated above background concentrations.
7. Page 8-1, Section 8.2, paragraph 3: Please address the 2010 Addendum to the Reuse Plan which also includes commercial uses for this area (i.e., shops and restaurants).
8. Page 8-2, Section 8.2: Although groundwater will be evaluated as part of SWMU 7 and 8, a construction worker conducting excavation work at SWMU 74 would be exposed to groundwater, which is at a depth of approximately 8 feet bgs. Therefore, clarify how cumulative exposure to all environmental media at SWMU 74 by a construction worker will be addressed in this HHRA.
9. Page 8-3, Section 8.3.1.1:
  - a. Please clarify why a baseline HHRA was conducted specifically for this subarea within SWMU 74 Fueling Piers Area and how this fits into the baseline risk assessment for SWMU 74 Fueling Piers Area (shown on Figure 2-4). It is unclear that this specific area is a unique exposure area requiring separate evaluation from the remainder of the Fueling Piers Area.
  - b. Please clarify whether the data excluded from this human health risk assessment because it is attributable to SWMU 7/8 was included in the HHRA conducted for that site.
  - c. Please clarify the apparent discrepancy between this section and Section 8.2 with respect to groundwater. Section 8.2 states that "...groundwater was determined to be impacted by a release from SWMU 7/8..." while this section states "...groundwater data for the Fueling Piers Area were omitted from evaluation in the HHRA since there is no indication that groundwater has been impacted by a fuel-related release..." Please clarify in the text whether conclusions made in the 2008 report were subsequently revised based on more recent data.

10. Page 8-12, Section 8.3.2.5: Please provide the rationale for assuming 25% of total body skin surface area exposure for the youth. A preferred approach is to evaluate what portions of the trespasser's body would be exposed (e.g., feet, lower legs, arms, etc.) and sum the skin surface areas for those body parts.
11. Pages 8-13 and 8-14, Section 8.3.2.5: Please clarify the difference between the on-site worker and the commercial/industrial worker as it appears they have the same exposure scenario in this HHRA.
12. Page 10-1, Section 10.0: Please clarify the rationale for applying the conclusions of the risk assessments conducted for the subarea investigated in the Phase II CMS to the entire Fueling Piers Area.
13. Figure 4-2: There are two locations labeled 74SB749 on this figure. Please clarify.
14. Appendix A, April 2011 Field Notes, Darrin Hupe: The field notes from April 29, 2011 do not indicate the depth of the soil samples collected at 74SB756 through 74SB760. Please clarify where this information was noted.

**TECHNICAL REVIEW OF THE DRAFT  
PHASE I RCRA FACILITY INVESTIGATION REPORT  
TERRESTRIAL INVESTIGATION  
PIÑEROS AND CEBEZA DE PERRO ISLANDS**

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

**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**

**November 3, 2011**

**TECHNICAL REVIEW OF THE DRAFT  
PHASE I RCRA FACILITY INVESTIGATION REPORT  
TERRESTRIAL INVESTIGATION  
PIÑEROS AND CEBEZA DE PERRO ISLANDS**

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

The following comments were generated based on a technical review of the *Draft Phase I RCRA Facility Investigation Report, Terrestrial Investigation Piñeros and Cabeza de Perro Islands* (RFI Report), dated September 2010.

**GENERAL COMMENTS**

1. It does not appear that the nature and extent of contamination has been defined at the site; however, Section 5, Conclusions and Recommendations, recommends no further soil sampling at the investigation areas. It is unclear why this recommendation is appropriate. For example:
  - It does not appear that the extent of chromium and arsenic contamination has been determined at the South Bunker Trail area. Arsenic concentrations detected in two samples (SS21 and SS22) exceeded the residential and industrial Regional Screening Levels (RSLs) and the site-specific background concentration. Chromium concentrations detected in two samples (SS21 and SS22) exceeded the residential and industrial RSLs; the site-specific background concentration was exceeded in one sample (SS22). In addition, the concentrations of three polynuclear aromatic hydrocarbon (PAHs) in one sample (SS22) exceeded the applicable residential RSLs and the site-specific background concentrations.
  - It does not appear that the extent of chromium and arsenic contamination has been determined at the North Bunker Trail area. Arsenic concentrations detected in three samples (SS24, SS25, SS27) and chromium concentrations detected in two samples (SS25 and SS27) exceeded residential and industrial RSLs and site-specific background concentrations. It is also unclear whether the extent of PAH contamination has been defined in this area, as five PAHs were detected in SS25 at concentrations exceeding the applicable site-specific background concentrations and the applicable residential RSLs. One PAH concentration also exceeded its applicable industrial RSL.
  - Review of Table 4-4, Ecological Screening of Surface Soil Detected Results indicates that numerous constituents were detected at concentrations exceeding Ecological Screening Values (ESVs) in several samples (including pesticides, selenium, arsenic, chromium, and PAHs).
  - No discussion and assessment of the exceedances relative to their potential sources has been included.

Revise the RFI Report to include a more detailed assessment of the exceedances relative to potential source areas. In addition, provide specific justification for why additional sampling is not needed to define the extent of contamination at each area where constituent concentrations exceeded applicable screening criteria and background concentrations.

Alternatively, propose additional soil sampling to define the extent of contamination at the site. It is noted in subsequent comments regarding the human health and ecological risk assessments that (1) the nature and extent of contamination should be defined such that data groupings are complete and representative of pertinent exposure units, (2) data gaps must be addressed prior to finalizing the risk evaluations/assessments for each site/area, and (3) the number of samples ( $n = 1$  or  $2$ ) collected at each of the six exposure locations is too small to assess "nature and extent" or to draw defensible conclusions in support of risk management decision making.

2. The report notes that 10 munitions and explosives of concern (MEC) were recovered from the surface and subsurface of the Piñeros Island trails and beaches. In addition, in excess of 35 anomalies were dug but subsequently abandoned without resolution due to the two foot depth of investigation or other access difficulties. As a result, the statement was presented in Section 5, Conclusions and Recommendations, that, "At a minimum, UXO construction support should be provided (by the property owner) if any trail development or other intrusive activity occurs." It should be noted that the provider of the noted construction support may be determined by agreement of the parties involved in the event a land transfer occurs. However, it should also be noted that these unresolved anomalies may be MEC, and their removal, or the removal of any other MEC subsequently found on the site, will remain the responsibility of the Department of Defense. As the beaches are in a dynamic environment that changes over time, the potential for MEC to be discovered there, particularly after any erosion-producing event, should be noted and addressed. Revise the RFI Report to address these issues.
3. The Screening-Level Ecological Risk Assessment (SLERA) presented in Section 4.2 of the RFI report does not follow EPA guidance in terms of its structure and intent. EPA 2001 (Eco Update. The role of screening-level risk assessments and refining contaminants of concern in baseline ecological risk assessments. EPA 540/F-01/014. June 2001) states: "This guidance reaffirms that a screening-level assessment, while abbreviated, is nonetheless a complete risk assessment." EPA 1997 (Ecological risk assessment guidance for Superfund: Process for designing and conducting ecological risk assessments. EPA 540/R-97/006) indicates that the first two steps of the ecological risk assessment process consists of (a) a problem formulation (e.g., environmental setting, suspected or known contaminants, contaminant fate and transport, potential receptors [including wildlife receptors, if applicable], complete exposure pathways, assessment and measurement endpoints) followed by an ecological effects evaluation, and (b) a screening-level exposure estimate and risk calculations, including an uncertainty analysis. While some of these elements are included in the SLERA, others are not. Reformat Section 4.2 of the RFI Report according to the SLERA guidance and ensure that all of the required items are presented and discussed in the report.

4. Section 1 of the RFI Report provides the location, physical description, and history of the two islands (i.e., Piñeros and Cabeza de Perro Islands) of interest to this RFI. Yet, all of the sampling activities described in the report appear to have occurred exclusively in and around Piñeros Island. It is not clear why Cabeza de Perro Island is included in the description. Amend the text to address this issue and explain how the lack of analytical data from Cabeza de Perro Island affects the overall risk conclusions.
5. Section 1.5 (Future Land Use Evaluation) on page 1-6 states: "The Phase 1 RFI approach was developed by identifying areas that are currently being accessed by the public and by evaluating areas that could potentially be used in the future [by the public]". This description shows that the locations sampled during the Phase 1 activities were selected exclusively based on concerns for human exposures. Figure 2.1 in the RFI Report shows that the sampling locations are mainly concentrated along a path going from South Beach to Northeast Beach. The report does not explain how these human health-driven sampling locations fully represent ecological exposures that may be experienced by ecological receptors throughout the island. At a minimum, discuss this issue in the uncertainty analysis of the SLERA.
6. Figure 1-4 in the RFI Report shows the presence of at least three surface water bodies on Piñeros Island. The report does not include any discussion about their physical characteristics (e.g., size, depth, salinity, substrate composition, ecological receptors), the possible ecological significance of these ponds to the rest of the island, or the potential for contamination to have reached these ponds over time due to overland water flow after rain events. At a minimum, justify why these water bodies were excluded from the SLERA. This issue should also be addressed in the uncertainty analysis of the SLERA, if necessary.
7. A single "background" soil sample (CT0113-SS30) was collected upgradient of the North Bunker trailhead and analyzed for explosive residues, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). It is unclear how any location on Piñeros Island can provide a true background sample considering that "Prior to 1987, training activities took place on all parts of Piñeros Island..." (first sentence, top of p. 1-4). These activities would have included small-arms training, pyrotechnics (e.g., smoke grenades, pop flares, grenade simulators), and standard military demolitions (e.g., claymore mines, plastic explosives), all of which could have resulted in soil contamination. Also, Table 3-5 presents the analytical data for this sample, even though the results are not discussed in the text. Finally, it is not possible to quantify background conditions based only on one sample. Remove the background soil data from the report and address this issue in the uncertainty analysis of the SLERA.
8. Twenty surface soil samples (CTO113-SS01 through CTO113-SS20) were collected from locations where munitions debris was found, as shown in Figure 2-1 of the RFI Report. Those samples were analyzed only for explosives residues. Ten additional soil samples were collected from other areas of interest (see Table 2-1). Appendix H provides the results of the analyses, which show that none of the explosives compounds were present above their analytical detection limits, except for 2,4-dinitrotoluene. Table 4-5 (Ecological Screening of Surface Soil Non-Detected Results) compares the available soil Ecological Screening Values

(ESVs) for explosives to the maximum detection limits. The SLERA remains essentially silent about these results, even though the explosives compounds were of prime interest to the investigation. Also, several new references for explosives ESVs are included in Table 4-5, but are not discussed in Section 4.2. Amend the text by including a subsection on explosives in Section 4.2 and discuss the sources for the explosives ESVs.

9. The limited Phase 1 sampling effort at Piñeros Island does not provide enough data to draw defensible conclusions about chemical contamination and the potential for ecological risk. The number of samples collected from the abandoned water storage tank ( $n = 1$ ), the post-detonation area ( $n = 1$ ; a composite sample), all the exposure points ( $n = 1$  or  $2$ ) and the background location ( $n = 1$ ) is too small and scattered to support risk-based decision making. Discuss in the uncertainty analysis the potential impact of a minimal data set on the risk conclusion. Also, address how the lack of "bounding samples" at locations where contaminant levels exceeded their ESVs (e.g., several organochlorine pesticides at the Helicopter Landing Pad) may have affected the risk conclusions.
10. The SLERA assesses risk based on a comparison of the maximum and the mean detected concentration of an analyte to its ESV. This approach is correct for the maximum comparison, but not for the mean comparison. The EPA guidelines allow risk to be refined in Step 3.a of the BERA by calculating a mean exposure. The reason it does not apply to this SLERA, however, is that only two samples are available per exposure area (see Table 4-4). It is unknown if such means truly represent average exposures without additional sampling. Hence, this information is not useful in risk management decision making. Remove the mean column in Table 4-4 and amend Section 4.2 to discuss maximum exposure risks only.
11. Appendix J, Conceptual Site Model (CSM) indicates that any current interaction with the islands is unauthorized, but that unauthorized access has occurred and future land use may allow limited public access to certain parts of Piñeros Island. Given current and reasonably anticipated future land use, receptors may include recreational users, wildlife management workers, and trespassers. Clarify why future hypothetical residents are not considered potential receptors worthy of consideration under SL or baseline assessment conditions (e.g., deed restrictions preventing residential development, or property has been classified by Puerto Rico Environmental Quality Board [PREQB] as not suitable for residential development).
12. A Screening Level Human Health Risk Assessment (SLHHRA) may not be sufficient for some sites/areas. Revise the RFI Report to address the following concerns:
  - a. It appears that fishing and/or crabbing may occur at various sites (e.g., Western Crabbing Area, various accessible beaches, etc.). The EPA Regional Screening Levels (RSLs) published in the generic table do not take into account exposure from fish or crab ingestion. Revise Section 4.0, Risk Evaluation, to specifically clarify where fishing/crabbing may occur, quantitatively evaluate fish/crab ingestion for these sites/areas/beaches, and update Figure 4-1, CSM to indicate fish/crab ingestion as a potentially complete pathway. Also, clarify if fish or crab tissue data are

available and reference appropriate sources. These sources should be summarized in any discussion of recreational or subsistence fishing exposure scenarios.

- b. Where multiple compounds were detected at concentrations that result in a constituent-specific risk on an order of magnitude of  $1E-05$  (e.g., Former Storage Area, Former Helicopter Landing Pad), a site-specific human health risk assessment (HHRA) should be performed to provide an understanding of cumulative exposures from multiple compounds. Multiple compounds with constituent-specific risk on the order of magnitude of  $1E-05$  may result in a cumulative risk greater than  $1E-04$ . Risk greater than  $1E-04$  warrants assessment and consideration of qualitative and/or quantitative corrective action objectives (CAOs).

Given that the need for removal action(s) or LUCs/institutional controls (ICs) (e.g., to restrict residential development) is largely dependent upon the results of the risk assessments, cumulative risk and hazard concerning all relevant constituents of potential concerns (COPCs) across all applicable pathways should be presented for each applicable exposure unit (i.e., investigation area).

13. The RSLs presented in the figures state "adjusted RSL" even for carcinogenic compounds. Revise Section 4.0, Risk Evaluation, and applicable tables and figures, to clarify that no adjustment of the EPA RSL was applied for polynuclear aromatic hydrocarbons (PAHs) as these compounds are evaluated based on their carcinogenic assessment endpoint.
14. The RFI Report does not contain a data usability discussion. While data validation reports (DVRs) have been included in Appendix I, a discussion of the quality control (QC) exceedances for all project data and how all of the qualifications affect data usability has not been included. Section 4.3.12, Specific Procedures Used to Assess Data, of the *Work Plan to Conduct Phase I RCRA Facility Investigation*, Revision 1, dated July 28, 2006 (Work Plan), indicates that a data assessment report will be prepared. It is stated that the report will summarize data accuracy, precision, and completeness and summarize the findings of the data review/validation as relevant to project usage. Revise the RFI Report to include a discussion of data usability.
15. The Work Plan indicates that data validation will be conducted using the Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Organic Data Review, dated 1999, and the CLP NFG for Inorganic Data Review, dated 2004. However, the Data Validation Reports (DVRs) included in Appendix I indicate that data validation was performed using the Region 2 SOP HW-6, Revision 13 for the Validation of Organic Data, dated January 2006, the Region 2 SOP HW-2, Revision 13 for the Evaluation of Metals Data for the CLP Program, dated September 2005, and the Explosives Residues SOP, Revision 1.3, September 1994. Revise the RFI Report to discuss why different data validation procedures were followed.

16. Several results presented in the RFI Report and Appendix H are qualified as rejected but include associated numerical results. For example, Page 9 of 9 reports the value of the rejected data for tetryl (i.e., "1.2R"). However, the tables should not report a value associated with rejected results, because the data has been rejected and is not usable. Revise the tables in Appendix H to remove the numerical results for all rejected results leaving the "R" qualifier only.
17. Results for several samples are reported in the RFI Report and Appendix H that are not included in the DVRs presented in Appendix I. For example, DVRs were not included for the soil sample collected in 2010. Further, soil samples CTO113-SS19-0-2-0806 and CTO113-SS20-0-2-0806 collected in August 2006 are not listed in any of the SDGs reported in Appendix I. Revise Appendix I to include data validation reports for all sample results reported in the RFI Report.

## **SPECIFIC COMMENTS**

1. **Section 1.1, Background and Project Objectives, Page 1-1:** This section indicates that the results of the underwater detonation areas investigation will be presented in a separate RFI Report. Clarify in Section 4.0, Risk Evaluation, if the forthcoming underwater investigation RFI Report will include a human health risk evaluation.
2. **Section 2.4, Intrusive Investigation, Page 2-3:** This section does not provide the total number of anomalies investigated or the number of anomalies that were abandoned without completion due to various reasons. Revise this section to include this information.
3. **Section 4.1.2, Surface Soil Samples, Page 4-2:** The text states towards the top of page 4-2, "No constituents were detected in the samples collected where MEC [munitions and explosives of concern]/MPPEH [materials potentially presenting an explosive hazard] items were found (CTO113-SS01 through CTO113-SS20). Therefore, no human health risk evaluation was required." Yet, the subsequent headers breakdown the SLHRA for each site/area. Revise the aforementioned statement for clarity. Ensure that the nature and extent of contamination (both munitions-related and non-munitions related constituents) are defined prior to finalizing the human health risk evaluations/assessments.
4. **Section 4.2.1, Surface Soil – Pesticides, Page 4-7:** The maximum and average concentrations for 4,4'DDT, 4,4'DDE, dieldrin, endrin, and gamma-BHC (lindane) exceed their ESVs at the Former Helicopter Landing Pad. These organochlorine pesticides exceeded their ESVs by a factor of two (4,4'DDE) to almost 40 (gamma-BHC). Such exceedances warrant further investigation, particularly in light of the small data set (n = 2) and the lack of "bounding" samples. Even though these chemicals are associated with historic uses, it does not negate the fact that they are present at levels of concern. Revise the conclusion of the SLERA (Section 4.2) as well as the Conclusions and Recommendation Section (Section 5.0) to state that these five compounds are present at levels that may require further investigation at the Former Helicopter Landing Pad.

5. **Section 5.0, Conclusions and Recommendations, Page 5-1:** The last paragraph states that arsenic and chromium concentrations were similar to the background sample concentration and mean NAPR background concentrations. An earlier comment in this review noted that the island-specific background data are not discussed in the RFI Report and are also not appropriate. The term "mean NAPR background concentration" is assumed to refer to a Site-wide background data set. If so, the data source needs to be referenced and the background data pertaining to arsenic and chromium needs to be provided for direct comparison. Edit the text accordingly.
6. **Table 3.6, Validated Tank Water Detected Results:** The table states that none of the contaminants analyzed in the surface water sample collected from the above-ground storage tank and its secondary containment are present above their analytical detection limits. This information is of limited use from an ecological perspective because it is not known if the detection limits (not included) exceed surface water screening benchmarks (also not included). At a minimum, provide the actual results of the surface water analysis in Table 3.6. Also, describe how the sample provides (or does not provide) data for use in risk assessment, particularly in terms of exposure pathways. Use this description to also clarify the reason(s) for collecting the surface water sample.
7. **Figure 2-1, Soil and Water Sampling Locations:** As discussed in Section 2.5.3, HTW Soil Sampling, nine surface soil samples were collected from the six areas of interest identified in Table 2-1, HTW Samples Collected in August 2006. The areas of interest have not been depicted relative to the sampling locations on Figure 2-1; as such, it is difficult to evaluate whether the sample locations were appropriate for evaluation of potential releases at these areas. Revise Figure 2-1 to depict the areas of interest relative to the sample locations.
8. **Table 3-5, Surface Soil Analytical Results:** The legend on this table indicates that shading denotes exceedances of the adjusted RSL for industrial soil. The concentration of chromium detected in sample CTO113-SS21-0-2-0806 exceeded the adjusted RSL for industrial soil but was not shaded. Several other instances such as this were identified in the table. Revise the table to ensure that all concentrations which exceed applicable RSLs for industrial and residential soil are appropriately marked.
9. **Table 3-5, Surface Soil Analytical Results:** The text of the RFI Report discusses concentrations of constituents relative to Naval Activity Puerto Rico (NAPR) background concentrations and that of the site-specific background sample collected as part of the RFI; however, the background concentrations have not been provided in Table 3-5 (or on any associated figures). Revise Table 3-5 to include all applicable background concentrations such that a comparison can be made for all sample results. It is also recommended that the background concentrations be presented on applicable figures. In addition, ESVs have not been presented on this table. Revise Table 3-5 to include all applicable ESVs such that a comparison can be made for all sample results. It is also recommended that the ESVs be presented on applicable figures.

10. **Table 4-4 Ecological Screening of Surface Soil Detected Results.** This table compares the measured concentrations of the analytes in soil to soil ESVs. Section 4.2 does not describe the order for selecting the soil ESVs. For example, preference needs to be given to EPA's Ecological Soil Screening Levels (Eco-SSLs) because they are nationally accepted, peer-reviewed, and "state-of-the-art" values. Other issues with the ESVs presented in Table 4-4 are as follows:

- The ESVs for PAHs by Beyer (1990) are dated and have been replaced by the Eco-SSLs for low-molecular weight and high-molecular weight PAHs.
- Some of the metal Eco-SSLs (e.g., lead and selenium) do not represent the lowest-available value.
- Ensure that the Dutch ESVs have been derived based on ecological considerations.

Amend Table 4-4, and the supporting text in Section 4.2, to address these issues. Note that the ESVs need to be introduced and discussed as part of the ecological effects evaluation of the SLERA.

11. **Table 4-5 Ecological Screening of Surface Soil Non-Detected Results.** The information summarized in this table is of limited value for risk management decision making because most of the non-detected analytes lack ESVs. Consider including soil ESVs from the following sources:

- U.S. EPA. 2003. Region 5 RCRA Ecological Screening Levels. Available at <http://www.epa.gov/reg5rcra/CA/ESL.pdf>
- U.S. EPA. 2001. Supplemental Guidance to RAGs: Region 4 Bulletins, Ecological Risk Assessment. Originally published November 1995. Website version last updated November 30, 2001: <http://www.epa.gov/region4/waste/ots/ecolbul.htm>
- U.S. EPA. Undated. Region 4 Recommended Ecological Screening Values (mg/kg) for Soil. Available at: <http://www.epa.gov/region4/waste/sf/programs/riskassess/epatab4.pdf>

Amend Table 4-5, and the supporting text, accordingly.

12. **Appendix I, DVR 10788, Blanks, Page 4:** The discussion for the volatile organic analysis (VOA) method indicates that some tentatively identified compounds (TICs) results were rejected due to detection in several blanks. It is unclear what concentrations were detected in the blanks and what sample results were rejected. Revise the DVR to provide more detail regarding the rejection of TIC results and/or include a discussion in the report that explains how TICs are considered for the investigation.

## MINOR COMMENTS

1. **Acronyms and Abbreviations, Page vii:** The definition of the acronym "MPPEH" found here differs from that presented in Section 1.1, Background and Project Objectives. The latter is the correct version per DoDM 6055.09-M-V8 (Department of Defense Ammunition and Explosives Safety Standards, Volume 8, Glossary). In addition, the term "MEC" should

be listed and defined in the Acronyms and Abbreviations section of the document. Revise the RFI Report to make these corrections/changes.

2. **Section 1, Introduction, Page 1-1:** The first paragraph states "CH2M HILL conducted a Phase I RCRA Facility Investigation (RFI) at Pineros and Cabeza de Perro Islands" though in the last paragraph of Appendix J, Conceptual Site Model, Section J.1, Introduction, page 2, the statement is made "Because no evidence of public trespass exists and access to the island from the shoreline is difficult, Cabeza de Perro Island was not investigated in the Phase I RFI." Revise the RFI Report to add this later statement to the main text of Section 1 of the report.
3. **Table 1-1, MEC-related items, Page 1-5:** The table contains a listing of "Booby traps" as having been found on the site. This is very likely not a reference to a complete booby trap, but probably refers to the firing devices used to construct the booby traps. Review the use of the term "Booby traps" found here and at any other location in the document and determine if the items under discussion are only the firing devices or complete booby traps, and revise the listings as needed to convey the correct identification of the items under discussion.
4. **Table 4-4 Ecological Screening of Surface Soil Detected Results, Table 4-5 Ecological Screening of Surface Soil Non-Detected Results, and Table 4-7 Ecological Screening of Post-Detonation Surface Soil Detected Results.** The full references for the ESVs should be referenced as footnotes on each table. At the least these references should appear in Section 6, References. Edit Tables 4-4, 4-5, and 4-7 to include all ESV references. Also, include these references in the References Section in the RFI Report
5. **Table 4-6 Ecological Screening of Surface Soil Total PAH Results.** The source of the Alternate ESVs is not provided. Add a footnote to Table 4-6 to provide the source of the Alternate Ecological Screening Value. Also, Section 4.2 does not discuss the use of this alternate screening value source. Amend the text and table accordingly.
6. **Appendix D, Dig Sheet Details:** An explanation is missing where one unique anomaly identification (ID) is listed more than once. Also, anomaly ID MRS05-023 states in the Comments column that there is a "Need to return at low tide." In addition, anomaly ID MRS05-036 states in the Comments column that the anomaly was "abandoned below water level." Revise the RFI Report to explain whether these two anomalies were fully evaluated. Also, explain any multiple uses of the same anomaly ID.
7. The report uses a number of slang terms and incomplete descriptions to identify the items recovered during the investigation. Slang terms include, but are not limited to:
  - Grenade Spoon: Correct term is Hand Grenade Safety Lever
  - Grenade Pin: Correct term is Hand Grenade Safety Pin
  - Grenade Ring: Correct term is Hand Grenade Safety Pin Pull Ring
  - Frag: Correct term is Fragments (it should be acceptable to use "frag" if this is defined in the Acronyms and Abbreviations listing or at the first use in the document)
  - Pop Flare: Correct term unknown

Incomplete descriptions include, but are not limited to:

- M18 Colored Smoke: What type of munition is this? Hand grenade, projectile?
- M201: What type of munition is this? Hand grenade, projectile, fuze, flare?

It should also be noted that the Comments Column of the table found in Appendix D, Dig Sheet Details, does contain the correct and complete nomenclature for the items found (in the majority of instances). These should be reflected in the body of the document and the tables found therein to ensure that the readers fully understand the identity of the items found.

Correct the use of slang munitions terms found in the document. Also, correct the incomplete descriptions of the munitions/items found in the body of the document.



COMMONWEALTH OF PUERTO RICO  
Office of the Governor  
Environmental Quality Board



ENC. #4

ENVIRONMENTAL EMERGENCIES RESPONSE AREA

November 8, 2010

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 Phase I  
RCRA Facility Investigation Report  
Terrestrial Investigation Piñeros and Cabeza de Perros Island  
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 Draft Phase I RCRA Facility Investigation Report, Terrestrial Investigation Piñeros and Cabeza de Perros Island, Naval Activity Puerto Rico, Ceiba, dated September 2010.

Attached, please find PREQB comments for your consideration. 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 6141.

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 00928-2804  
PO Box 11488, San Juan, PR 00910  
Tel. 787-767-8181

**PREQB Technical Review of the Draft Phase I RCRA Facility Investigation Report,  
Terrestrial Investigation Piferos and Cabeza de Perro Islands, Naval Activity Puerto  
Rico, Ceiba, Puerto Rico,  
Dated September 2010**

**I. GENERAL COMMENTS**

1. Please clarify why Cabeza de Perro Island is included in this investigation when no investigation of the island was conducted. The conceptual site model presented in Appendix J states that no investigation of Cabeza de Perro Island was conducted because there was no evidence of public access. Information is needed on the types of military activities conducted on Cabeza de Perro Island and whether the potential exists for munitions and explosives of concern (MEC) and munitions constituents (MC) to be present on this island. Further supporting documentation is needed for the assumption that trespassers or the public will not access this island. An evaluation of this information is needed to determine if an investigation of this island is warranted based on the potential for adverse impacts to human or ecological receptors and habitats.
2. Please describe in this report the method by which the US Coast Guard accesses Cabeza de Perro Island to maintain a light tower.
3. The scope of this investigation only includes the investigation of areas that are or may be accessed by the public in the future. However, this report documents that military activities occurred throughout the island, not just in these areas. As stated in the Conceptual Site Model (Section J2.1), historical data indicate that all of Piferos Island was potentially used for these military training exercises and most areas could currently contain MEC or MEC-related debris. The concern is that MEC and MC may be present in areas not investigated, since the scope of the investigation was limited to public access areas. Additional evaluation is needed to determine whether MEC and MC are present, especially in areas that were previously disturbed; depositional areas such as the wetlands associated with lagoons where important ecological resources are located; and where it is known that activities took place where MEC were used. For example, did small arms training take place throughout the island or was it limited to cleared areas? It is acknowledged that indiscriminant vegetation clearing would be detrimental to the island ecology, however, based on the description of vegetation communities present on Piferos Island, portions of areas previously disturbed by clearing activities would represent additional investigation sites that would minimize disturbance to the island environment.
4. Please clarify the path forward for the investigation of non-terrestrial environments, such as the lagoons, and whether the mangrove swamps and wetlands associated with aquatic environments will be evaluated as part of the non-terrestrial investigation.
5. Section 4.3.8 of the May 2006 Work Plan states that a separate data quality evaluation will be performed after data validation has been completed. Please revise the report to include this evaluation.
6. According to Table 3-5 in the RFI Report, the reporting limits for PAHs in soil were above the RSLs for five PAHs. Please explain why other analytical approaches (i.e., selective ion

monitoring) were not utilized in order to achieve these RSLs. Section 4.3.2 of the May 2006 Work Plan states that this Level 4 data will be used to determine the absence of contamination. Please provide a discussion in the report on the effect of reporting limits above the RSLs on the achievement of the project objectives (i.e., determining the absence of these contaminants).

## II. PAGE-SPECIFIC COMMENTS

### 1. Page 1-1, Section 1.1:

- a. The first objective of the investigation is to identify areas that are potentially accessible to the public under a land use scenario that allows limited access to the islands for recreational purposes. Please clarify why Cabeza de Perro was not evaluated. It is unclear that the island is inaccessible because the report states that the U.S. Coast Guard accesses the island to perform facility maintenance.
- b. Please provide a reference to the document that formed the basis for the proposed future land use scenario evaluated in this report.

2. Page 1-3, Section 1.4: Please include a discussion of the types of activities that took place at each military "area of interest," that may have resulted releases of hazardous substances, as these areas were selected for environmental sampling of surface soil. Please note that historic VOC impacts are not typically detected in surface soil; therefore, knowledge of past activities and handling/use of hazardous substances is needed to determine whether additional investigation of the subsurface is warranted.

3. Page 2-4, Section 2.5.1: One background surface soil was collected and identified as SS30. Based on its location presented in Figure 2-1, it appears this sample was collected in the near vicinity of samples representing source areas. In addition, based on the conceptual site model that identified former activities throughout the island, additional justification is needed to support this sample as a background sample. It would appear that background surface soils would need to be based on similar geological/soil characteristics at an undisturbed site off Piferos Island.

4. Page 2-4, Section 2.5.2: Please include a reference to Figure 3-1 for the locations of MD.

5. Page 2-5, Section 2.5.4: Please add text to this section that describes what was observed in the tank (e.g., were sheens or sludge observed in the tank; was the water clear; were there odors?)

6. Page 2-5, Section 2.5.5: Please clarify whether the detonation was controlled sufficiently to eliminate the ejection of fragments and other debris from the 1m x 1m sample area established around the crater. If not, the potential exists for impacts outside the area sampled and further sampling may be warranted. Please address.

### 7. Page 2-5, Section 2.5.5:

- a. Please clarify why the post-detonation samples were collected from 0-1 foot bgs rather than from 0-2 inches.
- b. Please clarify the following phrase "The subsamples, which were approximately equal in the amount of soil..." Please clarify if the author meant that all subsamples had approximately the same mass. If so, please consider rewording and provide the approximate target mass of the subsamples.

8. Page 3-2, Section 3.2, paragraph 2: Please include the M34 white phosphorous grenade in the list of MEC. The M34 is identified as MEC in the Appendix B "MRS Identification and Notification Report".
9. Page 3-3, Section 3.4:
  - a. Please provide the depths at which MEC and MD were found in this section (or on Table 3-3).
  - b. The second paragraph of this section states that "...Small arms were present, but did not pose an explosive hazard..." Please clarify if actual small arms were present or munitions associated with small arms were present.
10. Page 3-4, Section 3.4: In the second to last paragraph, please provide a text reference to Section 2.5.5, which discusses how the post-detonation sample was collected.
11. Page 3-5, Section 3.5.2: Please include the locations of the military "areas of interest" where environmental sampling was conducted on Figures 3-3 to 3-5.
12. Page 3-6, Section 3.5.2, Former Storage Area:
  - a. The text lists nine SVOCs that were detected in the Former Storage Area. Please revise the text to include benzo(a)pyrene and benzo(a)anthracene for a total of 11 SVOCs which were detected in this area.
  - b. Please revise the text to also include a discussion on the benzo(a)pyrene exceedance of the USEPA RSL for residential soil.
  - c. In the RCRA Metals section, please revise the text to remove the reference to sample CTO113-SS23 as this sample is not in the Former Storage Area and also does not exhibit an industrial RSL exceedance for arsenic as indicated in the text.
13. Page 3-10, Section 3.5.4, Paragraph 3:
  - a. Please revise the text to include the correct concentrations of arsenic and chromium detected in the post-detonation sample. The concentrations currently listed are from sample CTO113-SS25.
  - b. Subsequent to the correction above, please remove the reference to the industrial RSL exceedance for chromium.
14. Page 4-1, Section 4.1.2:
  - a. Please include a discussion of the applicability of using a background dataset comprised of background soil data from samples collected on the mainland for comparison to surface soil data from samples collected on Pineros Island.
  - b. Arsenic exhibits both carcinogenic and noncarcinogenic effects. Please discuss exceedances of the noncarcinogenic RSL, as applicable and resulting exceedances of the target hazard quotient of 1.
  - c. For public access areas, a human health risk assessment is warranted for those site-related constituents that exceed the applicable residential RSL and background levels to evaluate potential risks to current and potential future human receptors, including recreational receptors, unless it can be demonstrated that the industrial RSLs are protective of a reasonable maximum exposure scenario for all potential receptor groups.
15. Page 4-2, Section 4.1.2, Former Storage Area:

- a. Please revise the text to eliminate references to "adjusted" RSLs for carcinogenic compounds, as carcinogenic RSLs were not adjusted.
- b. Please include the arsenic concentration detected in sample SS-22, consistent with the presentation of the arsenic concentration detected in sample SS-21. This concentration, 49 mg/kg, significantly exceeds background and screening criteria. Please discuss potential military and nonmilitary sources for arsenic in this area, and provide further discussion on why no further investigation is warranted in this area to evaluate the extent of arsenic impacts.
- c. Please include a discussion of the potential for hexavalent chromium to be present in soils on Píneros and whether there are military-related sources for hexavalent chromium.

16. Page 4-6, Section 4.2: The proposed ecological soil screening values do not appear to follow any preferred hierarchy. The lowest of the USEPA eco-SSLs presented for appropriate receptors should be selected as screening benchmarks if available. A suggested resource for remaining contaminant benchmarks is CH2MHill's April 2010 Final Master Standard Operating Procedures, Protocols, and Plans – Environmental Restoration Program, Vieques, Puerto Rico. As currently presented, it appears that benchmarks for some contaminants are based on screening values developed for plants or invertebrates while others were selected based on avian screening values. The benchmark selected needs to represent the most conservative of the eco-SSLs presented for appropriate receptors that may inhabit Píneros Island. Please revise the benchmarks based on this factor as well as on more recently published benchmarks (e.g., 2,4-dinitrotoluene, di-n-butylphthalate, PAHs, 4,4-DDT, cadmium, lead, selenium, silver).

17. Page 4-7, Section 4.2.1: Please revise the discussion of metals detected in surface soil samples based on the inclusion of USEPA eco-SSLs. For example, selenium benchmarks discussed in this section do not include selenium eco-SSLs developed for plants, invertebrates and/or birds. In addition, please compare all metals that exceed their screening benchmark to appropriate background soil concentrations to put the exceedances into context.

18. Section 5:

- a. It is unclear that the "...The Phase I RFI provided surface clearance and subsurface clearance of MD and MEC/MPPEH over selected areas of Píneros Island..." or that "...There is no evidence to suggest that any explosive hazard due to MEC remains on the accessible beaches." The concern that these statements cannot be supported is based on the following:
  - The DQOs for this Phase I RFI were not developed to support a determination of "surface clearance and subsurface clearance";
  - There are numerous unresolved anomalies found during the EM and dig investigation that may be MEC (see Appendix D);
  - Only a small portion of Píneros Island was actually inspected; and
  - According to Appendix D there were numerous areas where obstructions prevented inspection.Please address these concerns.
- b. Please provide recommendations for additional investigation of MEC and MC for the portions of Píneros Island not included under the focused scope of work for this investigation and for Cabeza de Perro Island.

19. Table 3-5:

- a. Samples CTO113-SS01 through CTO113-SS20: The results for 2,4-dinitrotoluene are listed as "NA" (not analyzed). However, these samples were analyzed for 2,4-dinitrotoluene. Please revise the table to include the results for this compound for these samples.
- b. Please add the adjusted RSLs for residential and industrial soil for 2,4-dinitrotoluene.

20. Table 4-4: Please adjust the ecological screening benchmarks based on the previous comment provided above. Specifically, the values should be adjusted for 2,4-dinitrotoluene, 4,4-DDT, PAHs (both high and low molecular weight PAHs), di-n-butylphthalate, cadmium, lead, selenium and silver. Please revise quotients and the text discussion accordingly. Please note that for the eco-SSLs, the USEPA reference should note the year the specific eco-SSL was published (range from 2005 to 2008).

21. Table 4-5: Please adjust the ecological screening benchmarks based on the previous comment provided above. Specifically, the benchmarks should incorporate the values presented by CH2MHill (Final Master Standard Operating Procedures, Protocols, and Plans – Environmental Restoration Program, Vieques, Puerto Rico – April 2010). Please revise quotients and the text discussion accordingly.

22. Table 4-6: Please consider removing this table from the report based on the comments above concerning selection of more recent and appropriate ecological screening benchmarks for PAHs.

23. Figure 1-4: Please label the Land Crabbing Area on this figure, as Section 1.5 identifies this as being one of the three major areas investigated during the Phase I RFI. Please also identify the locations of the military "areas of interest" which were also investigated as part of this terrestrial investigation.

24. Figure 2-1:

- a. Section 2.2 references the "land crabbing area." Please identify this area on this figure.
- b. This figure shows the post-detonation sample location in a different location than the M34 WP Fragmentation Grenade location shown on Figure 3-1. Section 3.2 indicates that the detonation of the MEC occurred at the practice fragmentation grenade location. Please clarify the apparent discrepancies in the text and/or figures.

## Appendix J

1. Page 1, Section J.1: Please include a reference to the document that forms the basis for the future land use evaluated in this report.
2. Page 2, Section J.2.1, paragraph 3: This paragraph states that various training activities took place on both Pineros and Cabeza de Perro islands. Please provide further information on the types of training activities that took place on Cabeza de Perro Island. Please include a discussion of whether MEC may be present on Cabeza de Perro Island, as the paragraph only discusses the potential for MEC to be present on Pineros Island.

3. Page 6, Section J.2.5.2: Please clarify if a site visit was conducted on Cabeza de Perro Island to obtain the information presented about threatened or endangered species presented in this section.
4. Page 7, Section J.2.5.3: This section makes that statement that it is highly likely that all cultural resources have been obliterated by construction and use of the military complex. However, this statement is unsupported by the RFI and the text in this report. Only a small portion of Pineros was inspected. Please clarify or revise the text to indicate that it is not known whether cultural resources still remain on those portions of the island not investigated.
5. Page 8, Section J.3.2: Please include a discussion of potential future interactions, based on documented and proposed future land uses and potential future receptors that may come in contact with MEC.
6. Figure 4-1: This figure graphically presents the CSM for MC. Please include a corresponding figure graphically showing the CSM for MEC.