



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

NOV 03 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 59 (former Vehicle Maintenance and Refueling Area) - Draft Corrective Measures Study (CMS) Report, dated July 14, 2011
- 2) SWMU 69 (Aircraft Parking Area) – Draft Corrective Measures Study (CMS) Report, dated August 11, 2011
- 3) Revised Final Project Closeout Report for Soil Remediation at Various Sites (SWMUs 9, 13, 46, and 53 and AOC C), dated March 24, 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).

EPA has completed its review of the above documents, and has the following comments:

SWMU 59 - Draft Corrective Measures Study (CMS) Report

EPA has completed its review of the Draft CMS Report, submitted on behalf of the Navy by Mr. Mark Kimes' (of Michael Baker Jr., Inc.) letter of July 14, 2011. As part of that review, EPA requested our consultant, TechLaw Inc., to review the Draft CMS Report. TechLaw's comments are given in the enclosed Technical Review (Enclosure #1).

Although the human health risk assessment (HHRA) indicated no unacceptable risks under an industrial usage scenario, the ecological risk assessment (ERA) indicated that surface soils at SWMU 59 posed unacceptable risk to environmental receptors from metals (copper, lead, and zinc) in surface soils. Therefore, the CMS proposes a remedy of limited surface soil excavation in seven discrete areas where one or more of the proposed CAOs (168 mg/kg copper, 96 mg/kg lead, and 120 mg/kg zinc) for ecological risks were exceeded. EPA generally concurs with the recommendation in Section 10.0 (Justification and Recommendation of the Corrective Measure) that a total of approximately 915 cubic yards of surface soil exceeding the ecological CAOs be excavated in seven discrete areas. Those soils are to be disposed of at off-site landfills. As noted in Section 11.1 (Conceptual Design) of the CMS, prior to disposal, the excavated soils are to be screened for the characteristics of hazardous waste pursuant to 40 CFR Part 261.24, and then managed as either a non-hazardous solid waste or hazardous waste, depending on the results of appropriate waste characterization.

EPA notes that in our review of the ecological risk assessment, it was not possible to independently verify the Hazard Quotients (HQs) for wildlife receptors presented in Tables 7-22 to 7-24 since the CMS Report does not provide the receptor-specific estimated daily doses used to calculate these HQs. EPA recommends that the Navy include the food chain model tables in the final CMS report. EPA's inability to independently verify the wildlife HQ calculations appears to be a recurring problem which was observed during previous reviews of other CMS reports from NAPR. EPA requests that for the SWMU 59 CMS Report, and all future CMS reports for other SWMUs at NAPR which include ecological risk assessments, the CMS report should include all wildlife exposure calculation tables. The SWMU 59 CMS report already includes this type of information for the human health risk assessment (see Appendix L: risk calculation spreadsheets).

EPA agrees with the conclusions of the human health risk assessment (HHRA) and the Corrective Action Objectives (CAOs) presented in Section 8.4.1 of the CMS Report that based on human health considerations, *Qualitative* CAOs, including restrictions on potable use of groundwater and future residential land use, are required since human health risk estimates were calculated that exceed EPA's target limits for future residential receptors. Other than the total lifetime carcinogenic risk (sum of the total site carcinogenic risks for the adult and child receptors) for the future residential land use, the total site carcinogenic risks calculated for all media for all human receptors were within or below USEPA's target risk range of 1×10^{-6} to 1×10^{-4} .

In the human health risk assessments, no carcinogenic or noncarcinogenic risks were calculated that exceeded EPA's target risk range/hazard level for groundwater or surface water exposure by human receptor populations under an industrial land usage scenario. Therefore, *quantitative* CAOs are not required for soil, groundwater, surface water, and sediment, as long as the future land usage for the SWMU 59 site remains industrial.

The *qualitative* CAOs include land-use restrictions that will prohibit usage of groundwater for potable purposes and future residential usage of the SWMU 59 site. The indicated human health risk estimates were driven primarily by carcinogenic polycyclic aromatic hydrocarbons (PAHs)

and arsenic in soil, and arsenic in groundwater. Since the proposed *qualitative* CAO will assure that future land use of SWMU 59 remains industrial, *quantitative* CAOs were not required. However, the CMS should be revised to indicate that if a change in land usage at SWMU 59 is proposed in the future to include non-industrial usage and/or usage of groundwater for potable purposes, then the proposed final remedy would need to be revised to include *quantitative* CAOs for all constituents where carcinogenic or non-carcinogenic risks were calculated that exceed EPA's target limits for future residential receptors.

Within 90 days of your receipt of this letter, please submit revisions to the CMS to address the above comments and those in Enclosure #1. Please note that EPA's full approval of the proposed remedy cannot be given until completion of public review of that proposed remedy is completed pursuant to the requirements of the Consent Order. In preparation for such public review, please also submit within 90 days of your receipt of this letter a draft Statement of Basis for the proposed remedy.

In addition, the Puerto Rico Environmental Quality Board (PREQB) in its letter of October 7, 2011 to myself made extensive comments on the Draft CMS Report. A copy is enclosed (Enclosure #2). Within 90 days of your receipt of this letter, please also submit revisions to the CMS to address PREQB's comments given in Enclosure #2.

SWMU 69 – Draft Corrective Measures Study (CMS) Report

EPA has completed its review of the Responses to Comments and the Revised CMS Report, both of which were submitted on behalf of the Navy by Mr. Mark Kimes' (of Michael Baker Jr., Inc.) letter of August 11, 2011. As part of that review, EPA requested our consultant, TechLaw Inc., to review the Responses to Comments and the Revised CMS Report. Based on those reviews, EPA has determined that while the Responses to Comments are generally acceptable, a few issues must be addressed before they are fully acceptable. These are discussed in the enclosed Technical review prepared by TechLaw Inc (Enclosure #3). Within 75 days of your receipt of this letter please submit revised responses addressing the comments in Enclosure #3, along with any necessary changes to the CMS report to address the comments.

Also, EPA has determined that the proposed remedy, as described in Section 10.1 (Description of the Remedy) of the CMS is generally acceptable. The proposed remedy consists of excavation and disposal of approximately 2,221 cubic yards of vanadium contaminated soils and approximately 192 cubic yards of sediments in the drainage ditch adjacent to the aircraft runway apron. However, EPA's full approval of the proposed remedy cannot be given until completion of public review of that proposed remedy is completed pursuant to the requirements of the Consent Order. In preparation for such public review, please submit within 75 days of your receipt of this letter a draft Statement of Basis for the proposed remedy.

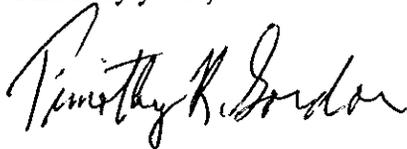
In addition, the Puerto Rico Environmental Quality Board (PREQB) in its letter of October 31, 2011 to myself made extensive comments on the Draft CMS Report. A copy is enclosed (Enclosure #4). Within 75 days of your receipt of this letter, please also submit revisions to the CMS to address PREQB's comments given in Enclosure #4.

Revised Final Project Closeout Report for Soil Remediation at Various Sites (Closeout Report)

EPA has completed its review of the Closeout Report submitted on behalf of the Navy by Mr. Pedro Tejada's (of Right Way Environmental Contractors, Inc.) letter of March 24, 2011. EPA in our letter of September 16, 2010 had approved the previous version (August 2010) of the Closeout Report; however, the Puerto Rico Environmental Quality Board (PREQB) had several comments on the August 2010 version of the Close Out Report. The March 2011 Revised Closeout Report reflects changes made to address PREQB's comments regarding the August 2010 version of the report. EPA concurs with the changes made, and hereby approves the March 2011 Revised Final Closeout Report.

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

Sincerely yours,



Timothy R. Gordon
Project Coordinator
Resource Conservation and Special Projects Section
RCRA Programs Branch

Enclosures (4)

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

Enclosure #1

**TECHNICAL REVIEW OF THE DRAFT
CORRECTIVE MEASURES STUDY REPORT SWMU 59
FORMER VEHICLE MAINTENANCE AND REFUELING AREA
DATED JULY 14, 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**

EPA Task Order No.	002
Contract No.	EP-W-07-018
TechLaw TOM	Cathy Dare
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EPA TOPO	Timothy Gordon
Telephone No.	212-637-4167

October 27, 2011

**TECHNICAL REVIEW OF THE DRAFT
CORRECTIVE MEASURES STUDY REPORT SWMU 59
FORMER VEHICLE MAINTENANCE AND REFUELING AREA
DATED JULY 14, 2011**

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

The following comments were generated based on a technical review of the *Draft Corrective Measures Study Investigation Report SWMU 59 – Former Vehicle Maintenance and Refueling Area* (CMS Report), dated July 14, 2011.

GENERAL COMMENTS

1. As discussed in Section 10.1, Description of the Remedy, the extent of contamination has not been defined at any of the proposed excavation areas. Section 11.1, Conceptual Design, indicates that confirmation samples will be collected from the side walls of each excavation area; however, given that the excavations are being conducted to address surface soil contamination, this approach does not appear to be appropriate, as concentrations detected in samples collected from side walls (i.e., at depths potentially greater than zero to six inches) may not be truly indicative of surface soil conditions. The Corrective Measures Implementation (CMI) work plan (also referred to in the report as the corrective action work plan) should propose the collection of pre-excavation surface soil samples to delineate the extent of contamination prior to excavation in order to ensure that the proposed removal action adequately addresses surface soil contamination. In addition, the CMI work plan should address how any exceedances detected during the pre-excavation sampling event will be addressed (e.g., collection of step out samples to fully define the limits of excavation to be performed at what frequency and distance). The CMS Report should be revised to acknowledge the additional sampling requirements to be addressed in the CMI work plan.
2. According to Section 9.5, Sediment, additional investigation is recommended to determine if copper, lead, and zinc have migrated beyond the pool at which these contaminants were detected. Details of this proposed investigation have not been provided. In addition, Figure 11-2, Conceptual CMI Schedule, does not reflect the need for additional sampling. As such, it is unclear if corrective action for sediment and surface water will be addressed separately from that of soil. Revise the CMS Report to clarify how corrective action for sediment and surface water is intended to be addressed relative to the site as a whole. In addition, clarify when the additional investigation will take place and if a separate work plan will be prepared which details the proposed investigation. Ensure that the CMS Report demonstrates a clear path forward for addressing all necessary corrective actions and that the schedule is revised to reflect each step.

3. The CMS Report does not adequately evaluate the selected remedial alternative. The CMS Report should be revised to convey how the selected remedy meets the following standards outlined in the May 1994 RCRA Corrective Action Plan (OSWER Directive 9902.3-2A):
 - a. Protect human health and the environment
 - b. Attain media cleanup standards
 - c. Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment
 - d. Comply with any applicable standards for management of wastes
 - e. Other factors such as reliability, effectiveness, and cost.

Revise the CMS to address these items as they relate to the proposed excavation and disposal of surface soil in a manner which clearly shows that the proposed excavations will achieve the objectives of the corrective measures process.

4. Based on review of the CMS Report, it appears that surface topography is influencing the migration of contamination at the site, and that surface water is the driving release pathway; however, no figure has been provided which depicts surface contours at the site. The site should be surveyed such that a figure can be developed which depicts the contours of the site and supports the conceptual side model. Revise the CMS Report to address this data gap in support of the additional surface water and sediment sampling and the locations of the proposed soil excavations. Sample locations should take into account potential contaminant migration pathways and release points due to topographical features.
5. According to Section 4.1, Surface and Subsurface Soil Sampling, numerous soil borings were advanced at areas other than their proposed locations for various reasons. While the rationales for the selection of locations that were actually sampled appear to be adequate, no comment has been made as to whether these changes to the work plan have resulted in data gaps at the original sample locations. For example, 59SB06 was proposed to be located on the northwest portion of the fuel island, but was moved 50 feet southwest of the fuel island to "identify possible contamination that may have migrated from the fuel island." It is unclear whether this has resulted in a data gap in characterization of potential contamination on the northwest side of the fuel island. Revise the CMS Report to discuss whether the altered sample locations have resulted in any data gaps, and if so, how these data gaps will be addressed.
6. It was not possible to independently verify the wildlife Hazard Quotients (HQs) presented in Tables 7-22 to 7-24 because the CMS 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.

7. Several analytical results were rejected during data validation, including groundwater and ditch surface water data points. These rejected data are not included in the frequency and range tables. The text explains that the analytes with rejected data were retained as chemicals of potential concern (COPCs) due to the unusable data. It would be helpful to include these rejected analytes in the frequency and range tables to show that these analytes were analyzed for but rejected, and therefore retained as COPCs, in step 3 of the CMS. Include the analytes in the tables with an "R" qualifier and explain in a footnote to the table why the analytes were retained.
8. Section 6.6.3 indicates that results for volatile organic compounds (VOCs) and for total metals did not meet the 90% completeness goal. While the section states that 1,4-dioxane, acrolein, isobutyl alcohol and methyl methacrylate are not likely related to SWMU 59, it does not discuss how the rejection of 2-butanone, acetone, acrylonitrile, propionitrile, total mercury and total zinc results affects the risk assessment process and the ability to meet project data quality objectives (DQOs). Please revise the CMS to discuss if these rejected analytes are considered COPCs and how the rejections affect the project DQOs and the risk assessment process.
9. The data validation reports (DVRs) do not provide the extent of all quality control (QC) outliers. For example, SDG 1004194, page 10 states that sample 59SB04-01 was re-analyzed due to high internal standard area recoveries and that re-analysis exhibited similar results. However, the results of the internal standard area recoveries are not listed. Revise the DVRs to provide the extent of all QC outliers.
10. The "R" qualifier is defined in the data tables (e.g., Table 6-6) 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 5.2.2, Hydrogeology, Page 5-2:** This section states that groundwater elevation measurements were collected on May 24, 2010, following groundwater sample collection and hydraulic conductivity testing. Given the disturbance to the water table prior to data collection, this elevation data is not likely representative of actual conditions. This is further supported by the fact that this "snap shot" of groundwater conditions contradicts the January 13, 2011 "snap shot." Therefore, elevation data collected on May 24, 2010 and presented on Figure 5-3, Groundwater Contour Map – May 24, 2010, should be removed from the CMS Report. Discussions regarding groundwater elevation and flow should be based on the data collected on January 13, 2011. Additionally, ensure that water level measurements are collected during the next field mobilization to confirm the January 13, 2011 portrayal of groundwater conditions.

2. **Section 5.2.2, Hydrogeology, Page 5-2:** The second paragraph in this section indicates that there is a groundwater divide in the western portion of the site. Based on review of Figure 5-4, Groundwater Contour Map – January 13, 2011, it appears that the groundwater divide is actually located on the eastern portion of the site. Revise this section to either revise the statement or more clearly describe the divide.
3. **Section 7.9.1.3, Step 3a Evaluation for Groundwater, Page 7-65:** Endrin aldehyde is missing from the list of non-detected pesticides identified as ecological COPCs, even though the maximum reporting limit exceeds the screening value. Table 7-19 lists endrin aldehyde as a non-detect selected as a COPC. Edit the text in this section to include endrin aldehyde and change the total number of non-detect pesticides identified as COPCs from 15 to 16.
4. **Section 7.9.1.4, Drainage Ditch Surface Water, Page 7-73:** The maximum HQ for non-detected metals (8.73) is not the HQ for silver as stated in this section. Table 7-20 lists the HQ for silver as 1.94. The maximum HQ for non-detected metals is 8.73, but represents cadmium. Edit the text in this section to list the maximum HQ (8.73) as the HQ for cadmium.
5. **Table 7-19, Frequency and Range of Groundwater Data (Maximum Concentrations) Compared to Groundwater Screening Values:** Hexachlorobenzene has a maximum HQ of 68.83, even though it is not listed as an Ecological COPC in the table. Hexachlorobenzene is correctly included as a COPC in Section 7.6.2.3 Groundwater. Amend Table 7-19 by listing hexachlorobenzene as an ecological COPC.

MINOR COMMENTS

1. **Section 7.9, Step 3a of the BERA, Page 7-50:** A screening value for dissolved copper was derived using the screening value for total recoverable copper listed in Table 7-6 (i.e., 3.46 µg/L) multiplied by a saltwater conversion factor of 0.830. The dissolved copper screening value listed in the text is 3.10 µg/L, even though $3.46 \mu\text{g/L} \times 0.830 = 2.87 \mu\text{g/L}$. Either the equation is incorrect or an incorrect dissolved metal value was used. Correct this discrepancy.
2. **Section 7.9.1, Refined Risk Evaluation, Pages 7-1 to 7-93:** Several tables referenced in the subsections of Section 7.9.1 are incorrect. For example, Section 7.9.1.1 references Table 7-13 as providing screening level risk estimates (i.e., HQs). Table 7-13 actually provides literature-based biota-sediment accumulation factors. Table 7-17 provides the screening level risk estimate (HQ values). Table 7-13 is incorrectly referenced throughout this section. Review all table references in the subsections under 7.9.1 and correct to reference the intended tables.

3. **Section 7.9.1.2, Step 3a Risk Evaluation for Subsurface Soil, Page 7-63:** This paragraph references Table 7-35 as providing the arithmetic mean and the 95% UCL of the mean for selenium in surface soil at SWMU 59 and for NAPR background. The values listed in the text for the SWMU 59 arithmetic mean and 95% UCL (i.e., 3.79 mg/kg, and 1.35 mg/kg, respectively) and the value for the NAPR background arithmetic mean (i.e., 0.64 mg/kg) correspond to the values presented in Table 7-35. However, the value in the text for the 95% UCL for the NAPR background (0.87 mg/kg) does not appear in the table. Table 7-35 lists NA for this value. Resolve this discrepancy by correcting Table 7-35 or editing the text in Section 7.9.1.2.
4. **Section 7.9.1.2, Step 3a Risk Evaluation for Subsurface Soil, Page 7-64:** The value for the refined risk estimate for zinc in subsurface soil (HQ = 0.55) is incorrect. Table 7-34 *Frequency and Range of Subsurface Soil Data (95% UCL of the mean concentrations)* lists a zinc HQ of 0.87. The text in this section needs to be corrected to provide the correct HQ for zinc in subsurface soil.
5. **Table 7-40 Hazard Quotient Values for Avian and Mammalian Dietary Exposures to Chemicals in Subsurface Soil: Step 31 Calculation:** Table 7-40 should be titled surface soil instead of subsurface soil. Table 7-41 is correctly labeled subsurface soil. Section 7.9.1.6 references Table 7-40 as surface soil and Table 7-41 as subsurface soil. Section 7.9.1.6.1 *Avian and Mammalian Dietary Exposures: Surface Soil* summarizes the data presented in Table 7-40. The title of Table 7-40 should be changed to surface soil. Also, change Step 3 Calculation to Step 3a Calculation.
6. Table 7-39 is listed in the table of contents and is referenced several times in section 7.9.1.5 Drainage Ditch Sediment. The CMS Report, however, does not provide Table 7-39. Correct this inconsistency.



COMMONWEALTH OF PUERTO RICO
Office of the Governor
Environmental Quality Board



ENC. # 2

ENVIRONMENTAL EMERGENCIES RESPONSE AREA

October 7, 2011

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

**RE: REVIEW DRAFT CORRECTIVE MEASURES
INVESTIGATION REPORT FOR SWMU 59 – FORMER
VEHICLE MAINTENANCE AND REFUELING AREA
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 Corrective Measures Investigation Report for SWMU 59 – Former Vehicle Maintenance and Refueling Area. The document was submitted by Michael Baker on behalf of the Navy.

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

**Technical Review Draft Corrective Measures Study Report
SWMU 59 – Vehicle Maintenance and Refueling Area
Naval Activity Puerto Rico (July 14, 2011)**

GENERAL COMMENTS

1. Development plans for NAPR are presented in the 2004 Reuse Plan and the 2010 Addendum to the 2004 Reuse Plan (which updates the reuse plan for Parcel III). PREQB requests that the future development plans presented in these Reuse Plans be included in this document as well as all other NAPR documents where future land uses are discussed. As future land use for this site is different than current land use, where future land uses include residential and recreational use of the area within which SWMU 59 is located, please revise this document, including the human health risk assessment and corrective action objectives, to reflect the anticipated future uses.
2. Please clarify why soil and groundwater samples were not analyzed for TPH-GRO and TPH-DRO, considering that USTs may have been present in support of fueling activities. Puerto Rico's Underground Storage Tank Regulation is an applicable, relevant and appropriate requirement for former UST sites.
3. Please provide further details on the efforts made to locate the USTs that supplied fuel to the fuel islands. Please include a figure showing the path of the magnetometer and visual surveys and discuss what historical records were reviewed as part of the effort of finding the tanks. Please provide details on how the magnetometer survey was conducted (i.e., depths visualized, calibration procedures and how results were reported, etc.) Please clarify how it was determined that the pipes observed at the fueling island were vent pipes and there is no possibility that they are the remains of fill pipes.
4. There appears to be a data gap for groundwater characterization downgradient from the fuel islands. SB06 and SB02 were collected immediately downgradient from the islands; however, based on groundwater velocity, groundwater moves at approximately 10 feet per year, indicating that contamination may have moved significantly to the west over time. SB01 only captures some groundwater flow from the fuel islands, and it does not appear that 74VP07b was sampled during the CMS. Please address.
5. Based on the information presented in this report, characterization of soils beneath the buildings present at the site was not conducted. Please clarify when these buildings were constructed or how long they have been in place. As future land use is likely to result in the demolition of these buildings and associated infrastructure, additional information is needed concerning what may be below the buildings, concrete pads or pavement.

PAGE-SPECIFIC COMMENTS

1. Page 1-1, Section 1.0: Revise the last sentence of the section to include that the field work was conducted with some deviations from the approved work plan that are detailed later in the report.
2. Page 1-2, Section 1.2: Please include information at the last paragraph regarding that the CMS will provide not only the quickest remediation of SWMU 59, the corrective action is also seeking the most effective remediation.
3. Page 2-2, Section 2.2; Paragraph 2: Please include a figure that shows the path taken during the magnetometer survey. This information is needed, as no UST was found based on this survey as well as a visual survey.
4. Page 2-3, Section 2.3.1: Please clarify in the text whether the subsurface soil sample interval with the highest PID reading was selected for off-site analysis.
5. Page 4-1, Section 4.0, Phase I ECP: Please include the depth to groundwater and the depth of the well screens in this summary. This information is needed to more fully understand the analytical results from the two temporary wells. If groundwater was observed in unconsolidated material but the well screens were positioned in bedrock discuss if the purpose was to sample across the water table or within the bedrock.
6. Page 4-2 and 4-3, General Comment: The CMS Work Plan for SWMU 59 proposed many soil sampling that once in the field resulted to be located on concrete surface. This trigger a deviation from the work plan since most locations were relocated to allow for surface soil sampling collection. Please discuss why no samples of soil beneath the concrete were taken, since this results will provide more information in the contamination delineation and source identification or if the samples taken during the Phase II ECP are considered enough to clearly delineate and identify the source of contamination.
7. Page 4-2, Section 4.1:
 - a. Bullets 2 and 3: Please acknowledge in these bullets, as has been acknowledged in the subsequent bullets, that the borings were moved in the presumed down-gradient direction of the referenced features. Ground water elevation contours were not generated until after the borings were installed.
 - b. Bullet 3: Please address whether a data gap exists as a result of moving SB02 approximately 70 feet west.
 - c. Please add a bullet for sample 59SB12 which was moved according to the May 18, 2010 (Page 38) field notes by Robert Roselius in Appendix A.
8. Page 4-3, Section 4.1, Paragraph 3: Please provide additional details regarding the method of collection for the VOC aliquots, as well as a brief rationale for failing to homogenize the soil sample aliquots for all non-volatile analyses.

9. Page 4-3, Section 4.2: Please add sample location 59SB12 to the locations mentioned at the last sentence of the first paragraph. It is unclear that monitoring well locations approved in the work plan were moved based on field conditions. It appears that the movement of the sample location was to allow for the collection of a surface soil sample based on the information presented in Section 4.1. Since subsurface and groundwater samples were also to be collected from these locations, please include information detailing the reasons for the movement. Also, please address the data gaps resulting from not collecting the subsurface and groundwater samples in the locations presented in the work plan.
10. Page 4-4, Section 4.2:
 - a. Paragraph 2: Please re-iterate in this paragraph what the well development criteria are or reference the section and paragraph which presents this information.
 - b. Last Paragraph: Please complete the first sentence of this paragraph.
11. Page 4-5, Section 4.4.1: It is indicated that all three surface water samples were collected from an appropriate depth determined in the field. Please include to the extent possible the appropriate depth from where the samples were collected.
12. Page 4-6, Section 4.4, Paragraph 1: Please provide further information as to why the laboratory was not able to fulfill the request for analysis of the sediment samples 59SD02 and 59SD03 for low-level PAHs.
13. Page 4-6, Section 4.5: When available, please submit evidence of the investigation derived waste disposal (copy of manifests).
14. Page 6-1, Section 6.0, Phase II ECP:
 - a. The first sentence states that contaminants detected in surface soil included VOCs, SVOCs, pesticides and inorganic compounds. However, Table 6-1 only presents detected inorganics. Please clarify.
 - b. The text refers to Tables 6-1 through 6-5 for subsurface soil sample results. Please revise to state Tables 6-2 and 6-3 only. Since Tables 6-4 and 6-5 presents groundwater results.
15. Page 6-2, Section 6.1, Surface Soil, Last Paragraph: Please include selenium in the list of metals detected above background screening levels in one sample (59SB20).
16. Pages 6-3 and 6-4, Section 6.2, Subsurface Soil:
 - a. Paragraph 2 on Page 6-3: Please change "dichloromethane" to "dibromochloromethane".
 - b. Paragraph 2 on Page 6-3: The text states that all VOC detections were relatively low (near the detection limit) with the exception of acetone. However, methyl iodide was detected approximately 5x higher than the detection limit in sample 59SB02/1-3 and bromoform was detected approximately 7x higher than the

- detection limit in sample 59SB02/7-9. Please revise the text to also include these exceptions to the relatively low detections of VOCs.
- c. Paragraph 3 on Page 6-3: Please change the reference from "Table 6-2" to "Table 6-7".
 - d. Paragraph 4 on Page 6-3: The summary of samples with the primary detections of pesticides is not accurate. Please revise to include the following samples: 59SB03-04, 59SB05-01, 59SB08-01, 59SB15-01, and 59SB18-01.
 - e. Paragraph 1 on Page 6-4: Please revise the text to include the detections of mercury above the background screening values in samples 59SB06-03 and 59SB16-05.
17. Page 6-4, Section 6.3:
- a. Paragraph 2: Please revise the text from "carbon dioxide" to "carbon disulfide."
 - b. Please include a discussion on the alpha-chlordane detection.
18. Page 6-6, Section 6.5, Sediment, Paragraph 3: Please include sample 59SD01 in the list of samples where fluoranthene and pyrene were detected.
19. Page 6-7, Section 6.6.1, Summary of Detected Compounds in Field QA/QC Samples, Paragraph 2: Please change "methyl chloride" to "methylene chloride".
20. Page 7-4, Section 7.1.2: Southern cat-tail (*Typha domingensis*) is described as being a type of hydrophobic vegetation. Please correct the text to indicate that this species is a hydrophytic plant. This comment also applies to Section 2.2, paragraph 2.
21. Page 7-14, Section 7.3.2.1: For lower trophic level species please consider adding fish to appropriate ecological receptors that will be evaluated by assessing the aquatic community present within the drainage ditch.
22. Page 7-29, Section 7.5.2.2.1: Fish tissue concentrations for inorganics are calculated using Biota: Sediment Accumulation Factors (BSAFs) derived from the literature. It is recommended that default BSAFs of 1.0 be used initially for inorganics (other than mercury) rather than rely on literature values that are unlikely to contain similar conditions as are present at SWMU 59. BSAFs are likely to be very site-specific and the application of reported values at one site may be inappropriate at another site. For example, Krantzberg and Boyd (1992) indicate that metals in their study may have low bioavailability due to complexing with iron and/or sulfur compounds as their site was a heavily polluted harbor. Thus, the BSAF values calculated from their study may significantly underestimate fish tissue concentrations at SWMU 59. Due to the conservative nature of a SLERA, default values of 1 should be initially used while Step 3A may consider alternative and site-appropriate BSAFs. An alternative approach would be to evaluate fish tissue concentrations based on BCFs and dissolved surface water concentrations.

23. Page 8-1, Section 8.2: Please revise the text of this section to reflect the likely future land uses for this area, and quantify a future recreational exposure scenario in the HHRA that evaluates exposure to surface soil, surface water and sediment.
24. Page 8-2, Section 8.3.1.1: Please indicate what version of ProUCL was used to calculation summary statistics on the data.
25. Page 8-3, Section 8.3.1.1:
 - a. Please discuss whether there are data gaps in the site characterization by not including the Phase II ECP data in the HHRA.
 - b. Paragraph 2: Please clarify whether the soil immediately beneath the concrete (from 0-1 foot below the concrete) was sampled, as this interval should be included in the surface soil dataset for future exposure scenarios.
 - c. Please specify the depths at which the second subsurface soil samples were collected, as it is unclear from this paragraph whether this data should be included in the HHRA.
26. Page 8-4, Section 8.3.1.2.1: As this document was published in July 2011, please update the Regional Screening Levels used for screening purposes.
27. Page 8-5, Section 8.3.1.2.1, paragraph 2: Please remove the last sentence from this paragraph as residential development is planned for this area.
28. Page 8-5, Section 8.3.1.2.2: Please also discuss whether there are natural processes occurring at the site that would produce Cr+6.
29. Page 8-6, Section 8.3.1.2.3: Please verify that all chemicals detected above RSLs are presented on Figures 8-1 through 8-4. It appears that organic compounds were not included on the figures (e.g., PAHs in surface soil, naphthalene in groundwater).
30. Page 10-3, Section 10.1, Paragraph 2: Please define what constitutes "clean fill". What level of sampling will be conducted and what criteria will be used to certify that the back-fill materials are "clean".
31. Table 4-1:
 - a. Surface and subsurface soil samples at locations 59SB02 and 59SB06 show a sample date of 4/19/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 4/20/10. Please revise.
 - b. Surface and subsurface soil samples at location 59SB09 show a sample date of 4/21/10. However, the field log book notes in Appendix A by Robert Roselius show a sample date of 4/22/10. Please revise.
 - c. Please correct the sample depth for sample 59SB09-01 to 1-3.
 - d. Surface water sample 59SW01 shows a sample date of 4/19/10. However, the field log book notes in Appendix A by Robert Roselius and Adam Gailey show a sample date of 4/20/10. Please revise.

- e. Surface water samples 59SW02 and 59SW03 and sediment samples 59SD02 and 59SD03 show a sample date of 4/20/10. However, the field log book notes in Appendix A by Robert Roselius and Adam Gailey show a sample date of 5/20/10. Please revise.
32. Table 4-2:
- This table states that equipment rinsate 59ER09 was collected from the Teflon-lined polyethylene tubing. The field notes in Appendix A by Adam Gailey confirm this. However, the field notes in Appendix A by Robert Roselius state that equipment rinsate 59ER09 was collected on 5/21/10 (not 5/22/10) and was collected from a Teflon bladder. Please confirm 59ER09 and whether all equipment rinsates were reported properly.
 - Please clarify why there were no trip blanks samples associated with the ground water sampling that took place on May 22 and 23. Also, please include a note on the table indicating what "RCI" stands for. The date associated with sample "59TB06" should be changed to 2010.
33. Table 4-4: Please correct the May 24, 2010 ground water elevations for wells 74VP07b and 13MW04.
34. Table 4-3:
- Please revise the preparation methods for TCLP VOCs to 5030B. The currently listed methods are applicable to SVOCs, not VOCs.
 - Please include the TCLP method 1311 in the preparation methods for TCLP SVOCs.
35. Table 4-4: There is a calculation error for the groundwater elevations for wells 74VP09b and 13MW04 for the May 24, 2010 round of water levels. The groundwater elevations shown are 5.95 ft and 3.32 ft, respectively. Please correct.
36. Table 6-6, Page 1 of 9: Many of the PAHs in surface soil sample 59SB04-00 were qualified with an "R" indicating that the results are rejected. However, as per the data validation report for SDG 1004194 in Appendix C, the PAH/SIM results in this sample were rejected due to linear range exceedances but these results were to be replaced with the PAH results from the full scan analyses since these PAHs were detected within the calibration range in this analysis. Please revise this table to include the full scan PAH results for this sample. The full scan results for PAHs in this sample should be used for risk assessment. Currently, the risk assessment sections of the report state that rejected data were not utilized and therefore this sample was not properly represented in the risk assessments. In addition, the PAH totals in this sample for low-molecular weight and high-molecular weight PAHs in Appendix B need to include the accurate results for each PAH. Please revise the report, ecological and human health risk assessment tables, and Appendix B accordingly.

37. Figure 5-3: Please appropriately label the southern-most 103.3 contour line and change the labeling on the southern-most contour line to 103.2.
38. Figure 8-6:
- Please add surface soil as a secondary source, where future recreational receptors, along with all other receptors would be exposed.
 - Commercial/Industrial workers are assumed to ingest 1 L of water per day while at work. Please revise the CSM to show this complete exposure pathway.
39. Figure 11-1: Based on the data shown, it is presumed that the three soil removal areas in the northeast corner of the site should connect, making one larger area. As the available data shows elevated concentrations of lead with no data between the locations shown to support the understanding that concentrations decline to below cleanup levels. Section 10 of the report does state that additional delineation may occur. It is recommended if these areas continue to be treated as separate areas, that additional delineation effort occur in this area to support this. This additional delineation should include samples to be collected to the north and east to confirm the lateral limits. Additional delineation sampling should also occur near the three areas in the southeast corner of the site, which abut the edge of the clearing to confirm the extent of contamination in the south and east directions.
40. Appendix A, Field Log Book Notes:
- The daily meter calibration record for 5/23/10 was not provided. Please submit since groundwater sampling was performed on this day.
 - The boring log for boring 59SB13 shows that a sample was collected at "59SB11-02". However, this should be 59SB13-05, per the field notes by Robert Roselius. Please revise accordingly.
 - The date on the Low Flow Purge Data Sheet for sample 59GW01 should be 5/22/10 per the field notes by Robert Roselius. Please revise accordingly.
 - 59GW07: Please explain why the pump intake was set at 19.5 feet which is outside the screened interval of 8-18 feet.
41. Appendix C, Data Validation Report Summaries:
- Please eliminate or relocate the cover page for the SDG1002745, since it is placed and no information is presented following it.
 - The cover page for SDG1005197 was incorrectly labeled SDG1005179, also the Puerto Rico Chemist certified SDG1005179 instead of SDG1005197. Please clarify.
 - The cover page for SDG1005177 was labeled SDG1005117. Please clarify.
 - SDG 1004194: Select PAH/SIM results in sample 59SB04-00 were rejected as these results were above the calibration range. The validation report states that the results for these rejected PAHs should be taken from the full scan analysis. However, as discussed in Comment # 36 above, this was not actually performed. SDGs 1005175 and 1005176: Based on these validation reports, the full scan SVOC and PAH/SIM analyses of all groundwater samples, surface water samples 59SW02 and 59SW03, and surface and subsurface soil samples collected at

locations 59SB11, 59SB12, 59SB14, 59SB15, 59SB16 and 59SB17 were performed outside of the 40-day holding time. The analysis of samples outside of the 40-day holding time is a very rare occurrence. Please provide further detail on the cause of this exceedance. Based on the results, PAHs may have been the most affected by this issue. Please ensure that the report and risk assessments take the potential low bias of the PAHs in these samples into account for all decision-making.

**TECHNICAL REVIEW OF NAVY RESPONSE TO EPA COMMENTS
DATED JANUARY 15, 2009
ON THE DRAFT CORRECTIVE MEASURES STUDY REPORT SWMU 69
DATED SEPTEMBER 12, 2008**

**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:

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205 West Wacker Drive
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EPA Task Order No.	002
Contract No.	EP-W-07-018
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October 27, 2011

**TECHNICAL REVIEW OF NAVY RESPONSE TO EPA COMMENTS
DATED JANUARY 15, 2009
ON THE DRAFT CORRECTIVE MEASURES STUDY REPORT FOR SWMU 69
DATED SEPTEMBER 12, 2008**

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

The following comments were generated based on a technical review of the Response to EPA Comments dated January 15, 2009 on the *Draft Corrective Measures Study Report for SWMU 69*, dated September 12, 2008. The *Revised Draft Corrective Measures Study Report for SWMU 69*, dated August 11, 2011, was also evaluated for compliance with the responses.

GENERAL COMMENTS

Evaluation of Response to EPA General Comment 2: The response addresses the comment. However, Table 4-1, Summary of Sampling and Analytical Program – Environmental Samples, indicates that 69SB25, 69SB26, and 69SB27 are temporary wells. Revise the CMS Report to remove this description.

Evaluation of the Response to EPA General Comment 3: The response is partially adequate. The Human Health Risk Assessment (HHRA) now quantifies exposure to future hypothetical adult and child residents. However, the HHRA states in Section 8.3.2.5, Exposure Parameters (p. 8-14), “An IR [ingestion rate] of 0.005 L/hour (professional judgment, assumes one order of magnitude less than the USEPA default ingestion rate for swimming) was used for surface water along with an ET [exposure time] of 2 hours/day (USEPA, 1997a) for both the adult and young [child] assuming a wading scenario. The EF [exposure frequency] was assumed to be 52 events/year (professional judgment) for surface water and sediment exposure.” These statements and others in the HHRA suggest that surface water exposures were quantitatively evaluated in the HHRA, but the HHRA risk and hazard summary tables and Response to EPA Specific Comment 16 indicate that surface water was not quantitatively evaluated. Revise the HHRA to correct this discrepancy.

Evaluation of the Response to EPA General Comment 4: The response is adequate. However, it should be noted that future CMS reports should also clarify those compounds that have sample quantitation limits (SQLs) (rather than method detection limits [MDLs]) that exceed risk-based screening criteria. Any compound not detected in any media with corresponding SQLs above risk-based screening criteria should be qualitatively evaluated in the HHRA based on factors such as current/historic site operations, potential as a breakdown product of a known site constituent of potential concern (COPC), or otherwise characterize its likelihood to be present at the site.

Evaluation of the Response to EPA General Comment 6: The response is partially adequate. The response indicates that the HHRA would be revised to use a particulate emission factor (PEF) of 1.36×10^9 m³/kg; however, Table 8-4, Summary of Exposure Parameters, indicates that a PEF of 1.39×10^9 m³/kg was used. Revise the HHRA to resolve this discrepancy.

SPECIFIC COMMENTS

Evaluation of Response to EPA Specific Comment 1: The response is partially adequate. The response indicates that brief descriptions of how the polygons on Figure 2-3 and 2-4 were derived would be included in Section 2.2, SWMU 69 Description and History. However, this section does not discuss how each of the polygons was determined, and instead includes a brief statement that identifies polygons as relating to areas of disturbances. Revise the CMS Report to describe the disturbances that the polygons represent for each year in greater detail.

Evaluation of Response to EPA Specific Comment 6: The response partially addresses the comment. The "R" qualifier is defined in the footnotes to indicate that the result has been rejected and the presence or absence of the analyte cannot be verified. However, 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.

Evaluation of the Response to EPA Specific Comment 16: The response is not adequate. Clarify why the lack of surface water data is not a HHRA data gap. Surface water was observed in the drainage ditch during the 2010 Disturbed Soil Sampling Investigation, but was not sampled. Both surface water and sediment samples are helpful in gaining an understanding of contaminant fate and transport associated with surface runoff from the adjacent expanded apron during precipitation events. Revise the uncertainty analyses for both the 2008 and 2010 HHRAs to describe the uncertainties associated with omission of surface water characterization.

Evaluation of the Response to EPA Specific Comment 12: The response is somewhat unclear. The response seems to indicate that the arbitrary uncertainty factors were used in the CMS Work Plan, but then replaced in the Screening Level Ecological Risk Assessments (SLERA) by uncertainty factors from Wentsel et al. (1996). The response is acceptable if this interpretation is correct. The response should be further clarified if this interpretation is incorrect.

ADDITIONAL GENERAL COMMENT

The Data Validation Reports (DVRs) included in Appendix C indicate that data were rejected; however, the data reported in Table 6-6, Summary of Detected Laboratory Results – 2010 Surface Soil, and in Appendix B, Laboratory Analytical Results, do not identify all of the rejected data. For example, the DVR for sample delivery group (SDG) 68060189-1 indicates that all vanadium results were rejected due to high matrix spike/matrix spike duplicate (MS/MSD) percent recoveries (%Rs). This SDG includes samples 69SB101-00 through 69SB106-02. However, Table 6-6 (i.e., page 1 of 7) and Appendix B (i.e., page 1 of 6) do not indicate that the vanadium results are rejected. Revise Table 6-6 and Appendix B to indicate that the data have been rejected. Additionally, remove the numeric values associated with the rejected data from Table 6-6.



COMMONWEALTH OF PUERTO RICO
Office of the Governor
Environmental Quality Board



ENCL. #4

ENVIRONMENTAL EMERGENCIES RESPONSE AREA

October 31, 2011

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

**Re: Review Response to Comments and
Revised Draft Corrective Measures
Study Report for SWMU 69
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 Draft Corrective Measures Study Report for SWMU 69 – Aircraft Parking Area. It was submitted by Michael Baker, Jr., Inc. on behalf of the Navy. The document was received on August 12, 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

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**Review Revised Draft Corrective Measures Study Report
for SWMU 69 – Aircraft Parking Area (August 11, 2011)
Naval Activity Puerto Rico, Ceiba
EPA ID No. PR2170027203**

Navy's Responses to Comments:

1. **PREOB General Comment 7:** Surface water samples should be collected from the same ditch segments during a rainfall event and analyzed to evaluate potential transport and offsite migration of surface soil chemicals of potential concern (COPCs) in surface water runoff from source areas. Due to the ephemeral nature of surface water runoff events any related ecological exposures would be brief. Please clarify why marine chronic ambient water quality criteria AWQC and other groundwater screening values were used rather than fresh water AWQC for surface water.

Navy Response: The Navy offers the following points of clarification relative to this comment. Based on groundwater flow direction, the Los Machos mangrove forest represents the most likely discharge point for SWMU 69 groundwater. As the Los Machos mangrove forest represents an estuarine environment, saltwater-based screening values were preferentially used to screen the groundwater analytical data.

PREOB Evaluation of Response: The response only partially addresses the comment. Please provide the justification why surface water samples were not collected within the drainage ditch during the four to five months when surface water was apparently present within the ditch.

2. **PREOB Page-Specific Comment 1: Page 2-3, Section 2.3, paragraph 2:** Please include the depth to groundwater and reference to a figure with the monitoring well locations for the UST investigation discussed in this paragraph.

Navy Response: Based on the Site Characterization of UST 794 in 1994 by Blasland, Bouck & Lee, Inc. (BB&L, 1994), the depth to water across the site was approximately 14 feet bgs. Soil boring and monitoring well locations are referenced on Figure 3-1 of that report. The second paragraph of Section 2.3 – Previous Investigations has been revised to include the depth to groundwater and a reference to Figure 3-1 of the BB&L report showing the monitoring well locations.

PREOB Evaluation of Response: The 1994 investigation appears to be the basis for concluding that groundwater is not impacted by the former UST. Therefore, please add sufficient detail from that investigation in this section to support this assumption. As part of the more detailed discussion, please provide the following: analysis performed on the samples; a figure that provides the locations of the UST and soil and groundwater samples; the soil depths at which TPH DRO was detected and associated TPH DRO concentrations, well screen intervals, and concentrations detected in groundwater. Please discuss whether concentrations left in soil could leach to groundwater above Puerto Rico UST levels for DRO

(especially over the last 18 years). Please also discuss groundwater velocity and expected travel distance for groundwater since the USTs were removed.

3. **PREOB Page-Specific Comment 15: Page 6-2, Section 6.1, Paragraphs 1 and 3:** The text states that the detected analytical results for the surface soil samples are provided in Table 6-1. However, Table 6-1 only provides the detected analytical results for metals and not VOCs and SVOCs. Please update Table 6-1 to include all detected analytical results in surface soils.

Navy Response: In Table 6-1, Summary of Detected Results – Surface Soil, the first four pages include VOC and SVOC detected analytical results.

PREOB Evaluation of Response: Please verify the response. Table 6-1 presents metals results for subsurface soil samples collected in 2008. Table 6-2 presents only VOC results for those same subsurface soil samples.

4. **PREOB Page-Specific Comment 74: Page 11-2, Section 11.1, last paragraph:** Confirmatory sampling should be intended to verify effectiveness of the corrective measures implementation. Sampling the bottom of the excavation area is recommended. It should be included at the Site-Specific Field Sampling and Analysis Plan that will be prepared and submitted for review.

Navy Response: As discussed in Section 10.1- Description of Remedy and Section 11.1 – Conceptual Design, bottom of excavation confirmatory sampling is proposed at the two foot below ground surface for Areas 1, 3 and 5. However, since the excavation depth for all areas is limited to a maximum depth of three feet below ground surface because of a lack of a complete exposure pathway for ecological receptors below this depth, confirmation samples from the three foot bottom of excavation depth are not required.

PREOB Evaluation of Response: Please address whether contamination will remain at 3 feet that could leach to groundwater at levels above Puerto Rico Water Quality Standards. Please clarify what methods were used to evaluate the potential for leaching (i.e., comparison to SSLs?).

Revised Draft Corrective Measures Study Report

General Comments:

1. **Page 2-3, Section 2.2 or Section 2.3:** Please clarify (and include in the text) the dates of use for the UST and when it was removed.
2. **Page 2-4, Section 2.3, paragraph 2:** This paragraph states “No groundwater samples were obtained at this site during the ECP investigation, but based on the reduction in concentrations from the surface soil to the subsurface soil collected during the investigation, it was tentatively concluded that groundwater had not been impacted.” Please clarify what follow up actions were taken to determine if groundwater has been impacted.

3. Page 4-3, Section 4.1, Surface and Subsurface Soil Sampling, 2008 CMS Investigation: Please include sample location 69SB27 in the first paragraph when discussing samples collected.
4. Page 4-2, Section 4.0, 2010 Disturbed Soil Sampling Investigation: Please clarify in the text the disposition of the soil stockpiles, and if unknown, what attempts were made to determine where the soil was taken. As this soil is from a SWMU and potentially contaminated, its disposition needs to be determined.
5. Page 4-4, Section 4.1, paragraph 1: Please clarify why no samples were collected from 3 feet to 9 feet bgs. Were PID readings used to select these depths or were these depth intervals preselected as part of the work plan? Please clarify in the text. It is unclear whether a data gap exists from 3 to 9 feet for site characterization and human health risk assessment based on the information presented.
6. Page 4-8, Section 4.7, Paragraph 3: Please indicate if the sediment sample locations were ultimately surveyed using standard methods, as it was noted that the surveyors were on-site in August 2010 and the sediment sampling was completed on November 5, 2010.
7. Page 4-9, Section 4.8.1, Field Duplicates, 2010 Disturbed Soil Sampling Investigation: Please remove sample 69SB141-01D from the list of subsurface field duplicates.
8. Page 5-2, Section 5.2.2: Please provide the depth(s) to groundwater in this section -- was it also found at depths ranging from 6 to 12 feet bgs?
9. Page 5-4, Section 5.2.4: Please correct the groundwater velocity (minor typo): "0.0.04 feet/day for the fractured clay..."
10. Page 6-1, Section 6.0:
 - a. Please clarify if any surface soil or sediment sample data from the 2008 investigation are from sample locations outside the disturbed area that were not resampled in 2010.
 - b. Please revise the second paragraph to indicate that the 2008 subsurface soil data are also presented in this section. The analytical data that characterizes the current conditions for all environmental media at the site need to be presented in this section.
11. Page 6-2, Section 6.1, Surface Soils, 2010 Disturbed Soil Sampling:
 - a. Please revise the text to state that nine metals (not seven) were detected in excess of background screening values.
 - b. Please revise the text to state that the lower range of the detected arsenic concentrations is 2.4 mg/kg at 69SB134-00.
 - c. Please revise the text to state that mercury was detected above background at 0.12 mg/kg in sample 69SB128-00 (not 69SB131-00D) to 0.18 mg/kg (not 71 mg/kg) in samples 69SB125-00 and 69SB130-00.

- d. Please add the detection of barium above the background screening value in sample 69SB126-00 to the text.
12. Page 6-4, Section 6.2, Subsurface Soil, 2010 Disturbed Soil Sampling:
 - a. Please revise the background screening value for mercury in the text to 0.10 mg/kg, as per Table 6-7.
 - b. Please revise the text to state that mercury exceeded the background screening value in 12 (not seven) samples.
 - c. Please revise the text to state that the lower range of the detected mercury concentrations is 0.11 mg/kg at 69SB106-02, 69SB121-01, 69SB121-02, 69SB136-02, and 69SB141-01.
13. Page 6-5, Section 6.4, Groundwater:
 - a. Paragraph 1: Include well 69GW25 in the list of groundwater samples.
 - b. Paragraph 3: Correct the spelling of acenaphthene.
14. Page 6-6, Section 6.5, Laboratory Data Validation Summary: Validation summaries were provided for SDG SWMU 68060189-10 (Section 6.5.11), SDG SWMU 68060189-11 (Section 6.5.14), SDG SWMU 68060189-12 (Section 6.5.16), and SDG SWMU 68060189-13 (Section 6.5.18). However, these data validation reports were not provided in Appendix C. Please submit.
15. Page 8-1, Section 8.0, General Comments:
 - a. Please note that comments made on the Revised Original HHRA also apply to the Disturbed Soil Sampling Investigation HHRA.
 - b. The purpose of presenting an update to a 2008 HHRA which no longer represents current conditions in the body of the CMS is unclear, especially since the conclusions of this earlier HHRA are not pertinent to the conclusions of the CMS. The Revised Original HHRA can be presented in an appendix with an introductory paragraph clarifying why this HHRA is appended to this CMS report. The current baseline HHRA (currently called the 2010 Disturbed Soil Sampling Investigation HHRA) then will be the only HHRA presented in the body of the CMS Report, which supports the conclusions of the CMS.
16. Page 8-1, Section 8.1, paragraph 3: Please revise the third sentence as subsurface soil and groundwater data are also evaluated in the 2010 HHRA to represent overall site risks for current site conditions.
17. Page 8-11, Section 8.3.2.4, paragraph 4: Please note that in order to combine all groundwater data for use in calculating exposure point concentration (EPCs), a demonstration that groundwater concentrations for all chemicals of potential concern (COPCs) are consistent throughout the plume (if identified) or aquifer is needed. Otherwise, groundwater data from only source area wells are used in calculating EPCs to ensure that risks associated with the installation of a private well in that area are evaluated. Note that for this assessment, the maximum detected concentration (MDC) was used; however, the rationale for grouping all groundwater data into one dataset needs to be addressed.

18. 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.
19. Page 8-12, Section 8.3.2.5: The vapor intrusion screening criteria presented in EPA's 2002 Vapor Intrusion Guidance are outdated due to updates in toxicity criteria. In order to incorporate these updates into the VI screening value development methodology, the current Regional Screening Level (RSL) for either residential or industrial air (adjusted as appropriate for noncarcinogenic chemicals) is multiplied by the groundwater to indoor air attenuation factor presented in Table 2s in the VI guidance of 0.001. Please update the screening in the revised report.
20. Page 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. If the commercial/industrial worker exposure scenario evaluates a typical indoor worker, then this future receptor needs to include ingestion of groundwater at 1 L/day (please also note that for an indoor worker receptor, a soil ingestion rate of 50 mg/day is acceptable, consistent with EPA Supplemental SSL guidance).
21. Page 8-27, Section 8.3.7: Please revise the first sentence of the first paragraph on this page for clarity. The cumulative cancer risk for each environmental medium was within the acceptable cancer risk range; whereas the overall site cumulative cancer risk exceeded the range.
22. Page 8-28, Section 8.4.1.1:
 - a. Paragraph 2: Please clarify the following statement, "As previously discussed, an HHRA based upon the data collected from this investigation will be included as a continuation of the present HHRA." Please clarify which HHRA is the present HHRA. If this phrase refers to the 2008 HHRA, it is unclear that the 2010 HHRA is a continuation of that HHRA; rather, it is a stand-alone HHRA that represents baseline conditions subsequent to soil disturbance.
 - b. Paragraph 4: Please clarify whether the entire SWMU was disturbed or whether areas remained undisturbed that were characterized during the 2008 investigation. If undisturbed areas remained, please include the data from these areas in this risk assessment.
23. Page 8-29, Section 8.4.1.2.2: The current RSL table, dated June 2011, includes screening criteria for thallium. Please update the HHRA accordingly.
24. Page 11-2 and 11-3, Bulleted Items: Please add a bullet requiring the surveying of the achieved lateral and vertical limits of excavation prior to initiation of backfilling. This will serve to confirm the required excavation limits have been achieved. This survey would also be needed to support development of as-built drawings as mentioned in Section 11.2.2 of the CMS Report.

25. Page 11-3, Bulleted Items: Please clarify the fifth from the last bullet which states, "Replace excavated sediments to achieve a ditch slope to promote positive drainage." As excavated sediments are to be disposed of offsite, there should be no replacement of these materials back into the drainage ditch.
26. Table 4-1: Please correct the depth of sample 69SB114-01 to 1.0-2.0 feet bgs.
27. Table 7-23: This table identifies cobalt as an ecological COPC that has a maximum concentration above the upper limit of the mean background concentration. However, the maximum detected concentration for cobalt is presented as 27 mg/kg while the background concentration used for the comparison is 44.13 mg/kg. Please clarify.
28. Table 8-2: Please provide the rationale for COPC selection in this table rather than referring to Table 8-1, which presents the rationale for a different dataset.
29. Table 8-4: Please provide a reference to where the PEF calculations are presented in the report in footnote 10.
30. Table 8-5 Please update this table and the spreadsheets in Appendix J to reflect the toxicity criteria presented in the June 2011 version of the RSL table.
31. Figure 5-3: Please amend the ground water elevation contour map to better reflect that which is inferred. The well network configuration at SWMU 69 is such that there is only a fairly narrow area in which ground water contours can be presented as "estimated" (solid line), beyond which the lines should be dashed.
32. Appendix A: The boring/monitoring well log for 69SB27 indicates elevated PID readings associated with several of the soil core intervals. The descriptions associated with select intervals reference odors being present. Please clarify (to the extent possible based on field notes and recollections) what type(s) of odors were detected....petroleum, solvent, etc.
33. Appendix J: Please update all spreadsheets to reflect the changes made to exposure factors and methodologies reflecting in the text of the report. For example (not an inclusive list):
 - a. Please verify the ingestion rate for the commercial/industrial worker in this table as Section 8.3.2.5 indicates that the ingestion rate for the commercial/industrial worker is 100 mg/day.
 - b. Please update the inhalation calculations to reflect the current approach, consistent with RAGS Part F.
 - c. Please update the ingestion rate for the construction worker to 330 mg/day.
 - d. Please update the exposure frequency for the construction worker to 250 days/year.