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LETTER TRANSMITTING REPLACEMENT PAGES FOR DRAFT CORRECTIVE MEASURES  
STUDY WORK PLAN FOR SOLID WASTE MANAGEMENT UNITS 27, 28 AND 29 NAVACT  
PUERTO RICO  
12/6/2011  
MICHAEL BAKER JR., INC.



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December 6, 2011

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

Attn: Mr. Adolph Everett, P.E.  
Chief, RCRA Programs Branch

Re: Contract N62470-10-D-3000  
IQC for A/E Services for Multi-Media  
Environmental Compliance Engineering Support  
Delivery Order (DO) JM01  
U.S. Naval Activity Puerto Rico (NAPR)  
EPA I.D. No. PR2170027203  
Final Corrective Measures Study Work Plan  
SWMUs 27, 28, and 29

Dear Mr. Everett:

Michael Baker Jr., Inc. (Baker), on behalf of the Navy, is pleased to provide you with one hard copy of the replacement pages for the Draft Corrective Measures Study Work Plan for SWMUs 27, 28 and 29, Naval Activity Puerto Rico for your review and approval. These replacement pages make up the Final Corrective Measures Study Work Plan for SWMUs 27, 28 and 29. Directions for inserting the replacement pages into the Draft Work Plan are provided for your use. Also included with the copy of the replacement pages is one electronic copy provided on CD of the Final Corrective Measures Study Work Plan for SWMUs 27, 28 and 29.

This document is being submitted in accordance with EPA comments dated April 19, 2011. The Navy's responses to those comments are attached for your review. Additional distribution has been made as indicated below.

If you have questions regarding this submittal, please contact Mr. Mark Davidson at (843) 743-2124.

Sincerely,

**MICHAEL BAKER JR., INC.**

Mark E. Kimes, P.E.  
Activity Coordinator

MEK/vk  
Attachments

**NAVY RESPONSES TO EPA COMMENT LETTER DATED APRIL 19, 2011  
DRAFT CORRECTIVE MEASURES STUDY WORK PLAN  
SWMUs 27, 28 and 29 DATED DECEMBER 15, 2010**

This document provides the Navy's final responses to government comments on Draft Corrective Measures Study Work Plan for SWMUs 27, 28 and 29. Following provides a brief summary of the timeline for this document project:

- Draft Corrective Measures Study (CMS) Work Plan for SWMUs 27, 28 and 29 submitted by Navy to EPA on December 15, 2010.
- EPA Comments on the Draft CMS Work Plan for SWMUs 27, 28 and 29 received by Navy from EPA on April 19, 2011.
- Working Draft Navy Response to EPA Comments on the Draft CMS Work Plan for SWMUs 27, 28 and 29 submitted by Navy to EPA on June 23, 2011.
- EPA Comments on the Working Draft Navy Response to EPA Comments on the Draft CMS Work Plan for SWMUs 27, 28 and 29 (comments received by Navy from PREQB, Gloria Toro Agrait via email in August 12, 2011 and received by Navy from EPA, Timothy R. Gordon via email on October 3, 2011).
- Navy Responses to the Working Draft Response to EPA Comments submitted by Navy to EPA on October 13, 2011.
- Navy receipt of PREQB approval of October 13, 2011 Working Draft Response to EPA Comments on October 17, 2011. Navy receipt of EPA approval on October 25, 2011.
- Final Corrective Measures Study Work Plan for SWMUs 27, 28 and 29 and the Final Navy Response to EPA Comment Letter dated April 19, 2011 (and all subsequent "working draft" documents)[this document].

The original comment number is retained to provide ready reference to EPA's April 19, 2011 comment letter. For reference, dates corresponding to the above timeline are included in parenthesis after each comment or response. Regulator comments are provided in *italics*, while the Navy responses are provided in regular print.

## **EPA COMMENTS**

### **GENERAL COMMENTS**

***EPA General Comment 1 (April 19, 2011):** The information contained in the Work Plan and in the referenced Final RCRA Facility Investigations Management Plans (Baker 1995) is insufficient to meet Quality Assurance Project Plan (QAPP) requirements. For example, because the laboratory has not been selected, laboratory specific standard operating procedures (SOPs), quality control (QC) limits, and quantitation limits (QLs) have not been included in the Work Plan. Additionally, Table 3-2 states that the QLs listed for solid samples are based on wet weight and that the quantitation limits calculated by the laboratory on a dry weight basis will be higher. Since screening levels are based on dry weight calculations, it is unclear whether the chosen laboratory's dry weight QL will be able to meet screening levels. Ensure that when a laboratory is selected, laboratory specific SOPs, QC limits, and QLs are included in the Work Plan as an addendum. Also, revise the Work Plan to clarify how it can be ensured that the laboratory will be able to meet screening levels when reporting results are on a dry weight basis.*

**Navy Response to EPA General Comment 1 (June 23, 2011):** The comment is noted. To help ensure that screening levels are met, required quantitation limits are provided to the laboratory as part of their contractual scope of work. Upon the selection of the subcontracted analytical laboratory for this investigation, laboratory specific SOPs and QC limits will be reviewed to confirm they will be able to meet the applicable screening levels. The analytical laboratory's specific SOPs, QC limits, and QLs will be included as an addendum to the Draft CMS Report. Additionally, upon further review of Table 3-2, it was discovered that outdated QLs were included in error for SW-846 Method 6020A (ICP/MS) analysis of groundwater. Therefore, Table 3-2 will be revised to include the most current QLs available for Method 6020A.

**EPA General Comment 2 (April 19, 2011):** *As stated in the introduction, the CMS Work Plan “is designed to provide a guide for selecting corrective measures to mitigate human health and ecological risks associated with contamination related to site operations.” Currently, the CMS Work Plan provides an analysis of data gaps and an approach for addressing them but does not identify chemicals of concern (COCs) for investigation. In order to implement the tasks and objectives of the CMS Work Plan, the COCs should be established for further investigation.*

**Navy Response to EPA General Comment 2 (June 23, 2011):** COCs will be determined upon completion of the ecological and human health risks assessments (as applicable) conducted as part of the CMS Reports. The CMS investigation is the final step in delineating contamination at the SWMUs. Once the SWMUs have been delineated and the risk assessments have been completed, COCs will be identified.

**Evaluation of the Response to EPA General Comment 2 (October 3, 2011):** *The response is partially adequate. It is noted that NAPR plans to determine the constituents of concern (COCs) upon completion of the ecological and human health risk assessments; however, the COCs should be established in the work plan in order to implement the tasks and objectives of the CMS Work Plan, as noted.*

**Navy Response to Evaluation of the Response to EPA General Comment 2 (October 13, 2011):** Anticipated contaminants of potential concern will be identified based on the results of previous investigations. However, it is reiterated that risk-based COCs will be identified as part of the human health and ecological risk assessments. Sections 1.3.1, 1.3.2 and 1.3.3 will be revised to identify the anticipated contaminants of potential concern. Specifically, the last paragraph of Section 1.3.1 Summary of Findings – SWMU 27 - Capehart WWTP Sludge Drying Beds will be revised to read as follows:

The data generated during the Phase I RFI and the Full RFI indicated the surface soil, subsurface soil and groundwater were impacted by past activities at SWMU 27. A preliminary human health risk evaluation was conducted to address exceedances of screening criteria. This evaluation demonstrated that the concentrations of arsenic in SWMU 27 soil, and chloroform and barium in groundwater would not cause unacceptable risks to human receptors. Therefore, with respect to human health, no chemicals of potential concern were identified and no further action was recommended to address human health concerns. However, based on the Phase I and Full RFIs, the anticipated ecological chemicals of potential concern include zinc and mercury in surface soil and chromium, copper and zinc in subsurface soil. Therefore, a CMS was recommended to quantify potential risk to ecological receptors. The CMS will include an ecological risk assessment (ERA) (Steps 1, 2 and 3a of the Navy ERA process described at <http://web.ead.anl.gov/ecorisk/>). Figures showing chemical distributions that exceed ecological screening criteria and background from the Full RFI report are provided as Appendix A (Baker, 2008a).

The last paragraph of Section 1.3.2 Summary of Findings – SWMU 28 – Bundy WWTP Sludge Drying Beds will be revised to read as follows:

Exceedances of human health and ecological screening criteria and exceedances of background screening criteria were observed in surface and subsurface soil indicating potential human health and/or ecological risks. The extent of Aroclor 1260 and metals contamination, primarily arsenic, barium, mercury, and zinc in surface soil east, south and west of the site has not been fully delineated. Additionally, the presence of various metals at concentrations in excess of both ecological screening values and background values indicates further ecological evaluation is needed for this site. Based on the results of the Phase I and Full RFIs, the anticipated human health contaminants of potential concern include:

- Surface Soil: Aroclor-1260, antimony, arsenic and mercury
- Subsurface Soil: barium
- Groundwater: total arsenic, barium, lead vanadium and zinc, and dissolved arsenic, barium and mercury

The anticipated ecological contaminants of potential concern include:

- Surface Soil: barium, chromium, copper, lead, mercury, tin and zinc
- Subsurface Soil: barium
- Groundwater: total chromium, lead, nickel, silver, vanadium and zinc

A CMS was recommended to further delineate contamination and to further define and quantify potential risk to human health and ecological receptors. The CMS will include a baseline human health risk assessment (HHRA) and an ERA (Steps 1, 2 and 3a of the Navy ERA process described at <http://web.ead.anl.gov/ecorisk/>). Figures showing chemical distributions from the Full RFI report are provided as Appendix B (Baker, 2008b).

The last paragraph of 1.3.3 Summary of Findings – SWMU 29 – Industrial Area WWTP Sludge Drying Beds will be revised to read as follows:

Antimony, arsenic, and cadmium were detected in surface soil at concentrations exceeding soil PRGs and background. A preliminary human health risk evaluation was conducted to address these exceedances. This evaluation demonstrated that the concentrations of these inorganics in SWMU 29 surface soil would not cause unacceptable risks to human receptors. Therefore, with respect to human health, no chemicals of potential concern were identified and no further action was recommended to address human health concerns. Additionally, no further action was recommended for groundwater at SWMU 29, since the Phase I RFI demonstrated no impacts to groundwater. However, based on the results of the Phase I and Full RFIs, the anticipated ecological chemicals of potential concern include barium, copper, zinc, and mercury in surface soil and copper in subsurface soil. Therefore, a CMS was recommended to address potential risks to ecological receptors. The CMS will include an ERA (Steps 1, 2, and 3a of the Navy ERA process described at <http://web.ead.anl.gov/ecorisk/>). Figures showing chemical distributions that exceed ecological screening criteria and background from the Full RFI report are provided as Appendix C (Baker, 2008b).

***EPA General Comment 3 (April 19, 2011):*** In Section 3.0 CMS Investigation, the historical exceedances from previous onsite sampling are not discussed in detail. Include details regarding the past sampling at the SWMUs including analytical results in order to clarify the magnitude of exceedances at each SWMU.

**Navy Response to EPA General Comment 3 (June 23, 2011):** Section 3.0 has been revised to include details and concentrations of historical exceedances at each SWMU in Section 3.1 (SWMU 27), Section 3.2 (SWMU 28), and Section 3.3 (SWMU 29). The first paragraph of Section 3.1 SMWU 27 (Capehart WWTP Sludge Drying Beds) has been edited to include concentrations detected during historic sampling events, as follows:

Based on the Phase I RFI and the Full RFI (Baker, 2008a and 2008b), mercury (0.12 J mg/kg to 1.3 mg/kg) and zinc (130 mg/kg to 420 J mg/kg) were detected in surface soil at concentrations exceeding both the ecological screening values and background. In addition, chromium (48 mg/kg to 150 J mg/kg), copper (63 J mg/kg) and zinc (98 mg/kg to 99 J mg/kg) were detected in subsurface soil at concentrations exceeding both the ecological screening values and background. The extent of this contamination as well as the boundary of the adjacent wetland needs to be delineated so that potential risk to ecological receptors may be evaluated.

The first paragraph of Section 3.2 SMWU 28 (Bundy WWTP Sludge Drying Beds) has been edited to include concentrations detected during historic sampling events, as follows:

Based on the Phase I RFI (Baker, 2007) and the Full RFI (Baker, 2008c), primarily mercury (exceedances of criteria ranging from 0.12 J mg/kg to 22 mg/kg), but also antimony (5.2 J mg/kg), arsenic (2.7 to 3.2 mg/kg), barium (360 to 980 J mg/kg), zinc (150 to 300 J mg/kg) and, to a lesser extent, other metals (chromium, copper, lead and tin) were detected in surface soil above human health and/or ecological surface soil screening criteria and background. The highest concentrations occurred east and southeast (down-slope side) of the sludge drying beds, at sample locations 28SB01-00, 28SB02-00, 28SB03-00, 28SB04-00, 28SB08-00, 28SB09-00 and 28SS10-00. Aroclor 1260 was also detected above human health screening criteria in surface soil samples, 28SB02-00 at a concentration of 510 ug/kg and 28SS10-00 at 300 ug/kg. Barium was detected above human health and ecological subsurface soil screening criteria and background in subsurface soil sample 28SB06-01 at a concentration of 620 J mg/kg and above background and ecological screening values from 28SB03-01 at a concentration of 380 mg/kg. Total barium ranging in concentration from 780 ug/L to 12,000 ug/L and dissolved barium (ranging in concentration from 330 J ug/L in the duplicate sample of 28TW02 to 710 J ug/L in 28TW03), as well as other metals were detected in the groundwater samples above human health screening criteria and background in the Phase I RFI and Full RFI groundwater investigations. Groundwater sample 28TW01 (Phase I RFI) resulted in exceedances above background and human health screening values for arsenic, barium, beryllium, lead, vanadium and zinc. Figures from the Full RFI (Baker, 2008c) presenting these exceedances are provided in Appendix B for reference.

The first paragraph of Section 3.3 (SMWU 29 - Industrial Area WWTP Sludge Drying Beds) has been edited to include the detected concentrations of historic sampling events, as follows:

Based on the Full RFI (Baker, 2008e), primarily mercury (with exceedances ranging from 0.16 mg/kg to 1.8 mg/kg in 29SB11-00) and copper (detected above background and ecological screening in three samples ranging from 180 J mg/kg to 230 J mg/kg) in surface soils and copper in subsurface soil (detected at concentrations of 200 mg/kg and 230 J mg/kg) require additional delineation to provide data for evaluation of ecological risks in soils associated with SWMU 29. Based on the Phase I RFI (Baker, 2008d), detections of mercury ranged from 0.11 J mg/kg to 1.5 J mg/kg, and copper was detected above base background and ecological screening criteria in two samples at concentrations of 190 J mg/kg and 230 J mg/kg. Other metals of potential ecological concern identified at one to two surface soil locations (from the Full RFI) included barium and zinc (detected in 29SB11-00 at concentrations of 350 mg/kg and 250 mg/kg, respectively). Figures from the Full RFI (Baker, 2008e) presenting these exceedances are provided in Appendix C for reference. These exceedances occurred on the east and west sides of the sludge drying beds, with the higher concentrations along the eastern side of the sludge drying beds.

**EPA General Comment 4 (April 19, 2011):** *The Work Plan discusses Acid Volatile Sulfide (AVS) Simultaneously Extracted Metals (SEM); however, this method is not discussed in the Master QAPP. Further, the Work Plan does not contain sufficient information on the AVS-SEM method to meet QAPP requirements. Revise the Work Plan to provide all QAPP required information for the AVS-SEM method.*

**Navy Response to EPA General Comment 4 (June 23, 2011):** Additional information pertaining to the AVS/SEM analysis, including container and preservation requirements, holding times, analytical method references and required quantitation limits have been incorporated into Table 3-2. The last paragraph in Sections 3.2.1.3 and 3.2.2.4 have been revised to read as follows:

Sediment samples will be collected with a stainless steel spoon from a depth of 0 to 0.5 feet bgs. The fraction of sediments tested for the AVS/SEM will be placed directly into sample jars without homogenization/compositing and will be filled completely to avoid head space and air pockets. After the AVS/SEM container is filled, the sediment sample for total metals and TOC will be placed in a disposable aluminum pan and homogenized with a stainless steel spoon and then placed in the sample containers. Samples for AVS/SEM will be cooled with ice as soon as is practicable. Although there is a 14 day holding time for AVS/SEM, it is preferable (albeit not required) to ship samples for receipt by the laboratory within 24 hours of sample collection. Similarly, the laboratory should be advised that it is preferable to begin extraction immediately on receipt of the samples. All pertinent sampling information such as sediment description (e.g., color and texture), sample number and location, presence or absence of aquatic invertebrates, and the time of sample collection will be recorded in the field logbook.

**EPA General Comment 5 (April 19, 2011):** *The decision process behind the selection of sample locations and depths and why it will address study goals is not clearly stated. Revise the Work Plan to include a more specific rationale behind why the number and locations of samples is sufficient to meet study goals.*

**Navy Response to EPA General Comment 5 (June 23, 2011):** The decision process behind the selection of the sample locations and depths is based on the results and conclusions in the USEPA Phase I RFI Reports and Full RFI Reports for Site 27, 28 and 29, as referenced in the Work Plan. Section 3.0 (CMS Investigation) also states for each SWMU both the contaminants that warrant further investigation as well as the media that requires further sampling. No edits to the Work Plan are proposed.

**Evaluation of the Response to EPA General Comment 5 October 3, 2011):** *The response is not adequate. The Work Plan should be a comprehensive document whenever possible; therefore references to the decision process behind the selection of sample locations and depths and why it will address study goals should be stated in the Work Plan. If the decision process behind the selection of the sample locations and depths is based on the results and conclusions in the Phase I RFI Reports and Full RFI Reports for Site 27, 28, and 29, discuss the pertinent results and conclusions in the Work Plan in order to facilitate transparency between documents and to allow for a demonstration that the study goals are being met.*

**Navy Response to Evaluation of the Response to EPA General Comment 5 (October 13, 2011):** The objectives of the CMS Investigations are clearly identified in Section 3.0. Pertinent results and conclusions from previous investigations are given in Sections 3.1, 3.2 and 3.3. Justification for the locations and depths of samples for the SWMU 27 investigation is provided in Sections 3.1.2.1 through 3.1.2.3; justification for the location and depths of samples for the SWMU 28 investigation is provided in Sections 3.2.2.1 through 3.2.2.4; and justification for the locations and depths of samples for the SWMU 29 investigation is provided in Section 3.3.1. No edits to the Work Plan are proposed.

**EPA General Comment 6 (April 19, 2011):** Section III.C.5.b of the May 1, 1996, Advance Notice of Proposed Rulemaking on Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities, 61 Federal Register, 19431 through 19464 (ANPR 1996) states that, “The 1990 proposal identified four remedy threshold criteria and five balancing criteria. The four threshold criteria proposed in 1990 were that all remedies must:

- (1) be protective of human health and the environment;
- (2) attain media cleanup standards;
- (3) control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases of hazardous waste (including hazardous constituents) that might pose threats to human health and the environment; and
- (4) comply with applicable standards for waste management.

EPA believes these threshold criteria remain appropriate as general goals for cleanup and screening tools for potential remedies.” Currently, these four threshold criteria are not listed as the initial screening (Step I) in the assessment of alternatives as explained in Section 8 of the CMS Work Plan. Revise Section 8 to specifically identify the listed assessment criteria.

**Navy Response to EPA General Comment 6 (June 23 2011):** This Work Plan was developed in accordance with the Resource Conservation and Recovery Act (RCRA) § 7003 Administrative Order on Consent (United States Environmental Protection Agency [USEPA] Docket No. 02-2007-7301[USEPA, 2007]). Attachment IV – Scope of Work for a Corrective Measures Study in the Consent Order specifically details the terminology and evaluation criteria that are required to be used and identified in the Corrective Measures Study Investigation and Report. This CMS Work Plan is designed to provide a guide for selecting corrective measures to mitigate human health and ecological risks associated with contamination related to site operations in accordance with the above mentioned RCRA § 7003 Administrative Order on Consent for NAPR. Although the terminology is slightly different, the overall corrective measure requirements of the § 7003 Administrative Order are generally consistent with other EPA guidance such as the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (October 1988, EPA/540/G-89/004).

Reference:

USEPA 1988. Guidance for Conducting Remedial investigations and Feasibility Studies Under CERCLA. October 1988. EPA/540/G-89/004.

USEPA, 2007. RCRA § 7003 Administrative Order on Consent. In the Matter of: United States The Department of the Navy, Naval Activity Puerto Rico formerly Naval Station Roosevelt Roads, Puerto Rico. Environmental Protection Agency, EPA Docket No. RCRA-02-2007-7301. January 29, 2007.

**EPA General Comment 7 (April 19, 2011):** Section III.C.5.b of the ANPR 1996 states that, “The 1990 proposal identified five balancing criteria for choosing among remedies that meet the threshold criteria. The five balancing criteria proposed in 1990 were:

- (1) Long-term reliability and effectiveness;
- (2) reduction of toxicity, mobility or volume of wastes;
- (3) short-term effectiveness;
- (4) implementability; and
- (5) cost.

Section 8, Task II and III do not include these specific assessment items which are similar to those used in the CERCLA Feasibility program. The Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (October 1988, EPA/540/G-89/004), hereafter referred to as the CERCLA Guidance, used under the CERCLA program provides examples of how to assess remedial alternatives against these criteria. Revise Section 8 to specifically list the assessment components associated with each of the five balancing criteria listed in the ANPR 1996.

**Navy Response to EPA General Comment 7 (June 23, 2011):** See Navy Response to EPA General Comment 6.

***EPA General Comment 8 (April 19, 2011):*** Section 8.4, Task IV, Reports, does not outline the content of the forthcoming CMS Report to include those sections listed in Section III.C.5 of the ANPR 1996. Revise Section 8.4 so that it matches the content as outlined Section III.C.5 of the ANPR 1996.

**Navy Response to EPA General Comment 8 (June 23, 2011):** See Navy Response to EPA General Comment 6.

## **EPA SPECIFIC COMMENTS**

***EPA Specific Comment 1 (April 19, 2011):*** ***Figure 3-1, Proposed Sample Locations SWMU 27 – Capeheart WWTP Sludge Drying Beds CMS Work Plan:*** Location 27SB03/27TW03 is noted as exceeding ecological screening criteria. The proposed surface and subsurface sample locations do not appear to bound the location 27SB03/27TW03 to the south and west. Revise the CMS Work Plan to include surface and subsurface sample locations that will result in the delineation of the exceedance at 27SB03/27TW03.

**Navy Response to EPA Specific Comment 1 (June 23, 2011):** There are two proposed surface soil samples to delineate the exceedances of ecological screening criteria in surface soil for zinc and mercury. Sample 27SS08 is proposed northwest of 27SB03/27TW03, and sample 27SS09 is proposed southeast of 27SB03/27TW03. Due to the seawall being approximately 10 to 15 feet southwest of sample location 27SB03/27TW03, and the location of the sludge drying beds approximately 10 to 15 feet to the northeast, the Navy feels that these two proposed sample points will adequately delineate the metals detected above ecological screening criteria in sample 27SB03/27TW03. No changes to the sampling plan are proposed.

***EPA Specific Comment 2 (April 19, 2011):*** ***Figure 3-2, Proposed Sample Locations SWMU 28 – Bundy WWTP Sludge Drying Beds CMS Work Plan:*** Location 28SS05 is noted as exceeding ecological screening criteria. The proposed surface and subsurface sample locations do not appear to bound the location 28SS05 to the north. Revise the CMS Work Plan to include surface and subsurface sample locations that will result in the delineation of the exceedance at 28SS05.

**Navy Response to EPA Specific Comment 2 (June 23, 2011):** One metal, mercury was detected in surface soil sample 28SS05 above background and ecological screening criteria. Samples west (28SS06) and east (28SB05/28MW05) did not result in exceedances of applicable screening criteria. It is unlikely that mercury contamination has migrated beyond the border of the sludge drying beds and across the road to the north of 28SS05; however, the Navy agrees to collect an additional surface soil sample from this area to further bound location 28SS05 to the north. One new surface soil sample (28SS42) will be added to the appropriate text, tables and figures.

***EPA Specific Comment 3 (April 19, 2011):*** ***Figure 3-3, Proposed Sample Locations SWMU 29 – Industrial Area WWTP Sludge Drying Beds CMS Work Plan:*** Location 29SB14 is noted as exceeding screening criteria and background. The proposed surface and subsurface sample locations do not appear to bound the location 29SB14 to the north and west. Revise the CMS Work Plan to include surface and subsurface sample locations that will result in the delineation of the exceedance at 29SB14.

**Navy Response to EPA Specific Comment 3 (June 23, 2011):** The first bullet of Section 3.3.1.1 - Surface Soil Sampling has been revised to include two surface soil samples 29SB21 and 29SB22 proposed north and west (respectively) of sample point 29SB14. The text has been revised as follows:

Five surface soil samples 29SS03 through 29SS07 are proposed west of the sludge drying beds in the vicinity of borings 29SB05 and 29SB07, where surface soils exhibited concentrations of mercury above ecological screening criteria and background. In addition, two surface soil samples 29SB21 and 29SB22 will be collected north and west respectively of sample point 29SB14 where surface soil also exhibited concentrations of mercury above ecological screening criteria and background in surface soils.

**EPA Specific Comment 4: Section 3.2.2.3 Monitoring Well Installation, Page 3-9 (April 19, 2011):** *The text states that during well development, any one or a combination of several indicators will be used to complete the well development, including a visual determination. It is recommended that if utilizing a visual determination, at least one additional indicator also be utilized since a visual determination when utilized alone may not accurately indicate a thorough well development. Revise the CMS Work Plan to specify that a visual determination will not be the sole indication when developing a monitoring well.*

**Navy Response to EPA Specific Comment 4 (June 23, 2011):** The last paragraph of Section 3.2.2.3 has been revised to add a statement that if visual determination is used as an indicator that a well is fully developed that another indicator should also be used. The paragraph has been revised as follows:

If visual determination is used as an indicator to determine if well development is complete, then at least one of the other indicators listed above will also be used. A record of the well development will be completed to document the development process. Monitoring well installation and well development procedures will be conducted following the procedures in Final RCRA Facility Investigation Management Plans (Baker, 1995).

**EPA Specific Comment 5: Section 4.11, Corrective Measures Study, Page 4-2 (April 19, 2011):** *The CMS Work Plan states that, "If the results of the investigation indicate that a streamlined CMS approach is appropriate, then a CMS will be prepared in accordance with Section 8, Tasks III and IV; otherwise, a full CMS will be prepared in accordance with Section 8, Tasks I through IV." No criteria for making such a determination are provided. Further, such decisions are typically made in conjunction with stakeholders and are presented as part of the CMS approach detailed within the CMS Work Plan. Revise the CMS Work Plan to provide the basis for determining when a streamlined CMS would be appropriate for SWMUs 27, 28, and 29. If the basis for this determination is not presented by the Navy and approved by EPA, the CMS selection criteria outlined in Section III.C.5.b of the ANPR 1996 should be included in the CMS, as discussed in General Comments 6 and 7 above. Additionally, note that in the ANPR 1996, a streamlined CMS now refers to presumptive remedies and the CMS Work Plan should be revised to use this more current term.*

**Navy Response to EPA Specific Comment 5 (June 23, 2011):** This Work Plan was developed in accordance with the Resource Conservation and Recovery Act (RCRA) § 7003 Administrative Order on Consent (United States Environmental Protection Agency [USEPA] Docket No. 02-2007-7301[USEPA, 2007]). Attachment IV – Scope of Work for a Corrective Measures Study in the Administrative Order specifically details the terminology and evaluation criteria that are required to be used and identified in the Corrective Measures Study Investigation and Report.

Specific criteria for implementing a streamlined CMS is not included in the Consent Order, nor is specific criteria for identification and selection of a presumptive remedy included in the referenced 61 Federal Register pages 19431 through 19464 (ANPR 1996). However, ANPR 1996 does emphasize that identification of a presumptive remedy is a preferred course of action. Selection of a presumptive remedy and conducting a streamlined CMS will be based on EPA guidance, if available and on professional judgment. Confirmation "that the presumptive remedy is appropriate to facility-specific conditions" (ANPR 1996) will be presented in the CMS report.

Section 4.11 – Corrective Measures Study will be revised to read as follows:

If the results of the investigation indicate that a streamlined CMS approach is appropriate, based on current EPA guidance and professional judgment, then a streamlined CMS will be prepared showing that the presumptive remedy is appropriate to facility-specific conditions and in accordance with Section 8, Tasks III and IV; otherwise, a full CMS will be prepared in accordance with Section 8, Tasks I through IV to evaluate a broader range of remedial alternatives.

References:

USEPA, 2007. RCRA § 7003 Administrative Order on Consent. In the Matter of: United States The Department of the Navy, Naval Activity Puerto Rico formerly Naval Station Roosevelt Roads, Puerto Rico. Environmental Protection Agency, EPA Docket No. RCRA-02-2007-7301. January 29, 2007.

ANPR 1996. USEPA. Advance Notice of Proposed Rulemaking. Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities. 61 Federal Register, pages 19431 through 19464. May 1, 1996.

***EPA Specific Comment 6: Section 5.3.1.2 Transport Pathways, Page 5-9 (April 19, 2011):*** *The last bullet states that uptake by biota from surface water and sediment and trophic transfer to upper trophic level receptors in SWMU 27 is a complete transport pathway. This pathway is accurately shown in Figure 5-11 for SWMU 27. However, Figure 5-12 also shows this pathway as complete for SWMU 28, even though no information has yet been collected about the presence of surface water and sediment at this SWMU. Remove this pathway from Figure 5-12 until it is shown that surface water and saturated sediment are present at SWMU 28. Alternatively, add a footnote to Figure 5-12 explaining that the sediment/surface water pathway to biota update is yet to be determined.*

**Navy Response to EPA Specific Comment 6 (June 23, 2011):** The Navy offers the following points of clarification relative to this comment. Figure 5-12 shows one potentially complete transport pathway from SWMU 28 to the E2FO3 wetland immediately east of the sludge drying beds: leaching of chemicals from surface and subsurface soil by infiltrating precipitation and transport to downgradient E2FO3 surface water and sediment. This pathway is depicted on Figure 5-12 based on groundwater flow direction at the SWMU (east, toward the E2FO3 wetland; see Figure B7 included within Appendix B of the draft work plan). Given that groundwater flow at SWMU 28 is toward the E2FO3 wetland, the wetland represents a likely discharge point for SWMU 28 groundwater. As such, the Navy does not believe that revisions to Figure 5-12 are necessary.

It is noted that informational data gaps are present at SWMU 28 regarding the E2FO3 wetland. This is acknowledged (as appropriate) throughout the draft work plan. The preliminary conceptual model presented within the ecological risk assessment (ERA) that will be included as part of the future Corrective Measures Study (CMS) report will incorporate site-specific information collected during the CMS field investigation to ensure that transport pathways, exposure media, exposure routes, and receptors are accurately depicted.

***EPA Specific Comment 7: Section 5.3.1.2 Transport Pathways, 2<sup>nd</sup> paragraph, Page 5-9 (April 19, 2011):*** *This paragraph states the following: “Currently, it is not definitively known if saturated sediments and/or surface water are present within the E2FO3 wetland unit adjacent to SWMU 28. If encountered during the CMS field investigation, overland transport of chemicals with surface soil via surface run-off to down-gradient surface water and sediment, as well as uptake by biota from surface water and sediment and trophic transfer to upper trophic level receptors will be acknowledged as potential transport pathways at SWMU 28”. The text needs to specify that the CMS field investigation may not find saturated sediments and/or surface water unless the investigation occurs during the wet season. Amend this paragraph accordingly, and explain how this issue will be addressed if sampling occurs in the dry*

season. Also, specify if this same principle may also apply at SWMUs 27 and 29.

**Navy Response to EPA Specific Comment 7 (June 23, 2011):** As discussed in Section 3.2.1 of the draft work plan, the E2FO3 wetland boundary will be field delineated in accordance with the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Caribbean Islands Region (USACE, 2009). Hydric soil and vegetation indicators, as well as hydrology indicators will be evaluated as part of the delineation process. A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (see Federal Register 59(133): 35680-35681, July 13, 1994). Hydric vegetation occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence on the plant species present (USACE, 2009). Because wetlands can contain soils with hydric characteristics, as well as sediment, proposed sampling locations within the boundary of the field-delineated wetland also will be evaluated to determine if they may support organisms (benthic macroinvertebrates such as fiddler crabs) typically associated with an estuarine aquatic community. As such, the absence or presence of saturated sediments and/or surface water will not be used as the only indication to determine if overland transport of chemicals with surface soil via surface run-off to downgradient surface water and sediment, as well as uptake by biota from surface water and sediment and trophic transfer to upper trophic level receptors warrant consideration as potential transport pathways at SWMU 28. If proposed sampling points are located within the field-delineated boundary of the E2FO3 wetland and field observations indicate that these areas support benthic macroinvertebrates typically associated with an estuarine aquatic community, these transport pathways will be evaluated by the ERA.

The second paragraph on Page 5-9 will be revised to acknowledge that saturated sediments and/or surface water may not be found if sampling occurs during the dry season. This paragraph also will be revised to include the information presented above. Revised text is shown below.

Currently, it is not definitively known if saturated sediments and/or surface water are present within the E2FO3 wetland unit adjacent to SWMU 28. If encountered within the area of investigation (i.e., area encompassed by the proposed sample locations) during the CMS field investigation, overland transport of chemicals with surface soil via surface run-off to downgradient surface water and sediment, as well as uptake by biota from surface water and sediment and trophic transfer to upper trophic level receptors will be acknowledged as potential transport pathways at SWMU 28. It is noted that saturated sediments and surface water may not be found within the area of investigation if sampling is conducted during the dry season (lowest average monthly rainfall totals at NAPR occur from January through April [<http://www.weatherbase.com/index.php3?set=us>]). As discussed in Section 3.2.1, the E2FO3 wetland boundary adjacent to SWMU 28 will be field delineated in accordance with the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Caribbean Islands Region (USACE, 2009). The field delineation process will include an evaluation of hydric soil and vegetation indicators, as well as hydrology indicators. Because wetlands can contain soils with hydric characteristics, as well as sediment, proposed sampling locations within the boundary of the field-delineated wetland also will be evaluated to determine if they may support organisms (aquatic macroinvertebrates such as fiddler crabs) typically associated with an estuarine aquatic community. If proposed sampling points are located within the field-delineated boundary of the E2FO3 wetland and field observations indicate that these areas support benthic macroinvertebrates typically associated with an estuarine aquatic community, overland transport of chemicals with surface soil via surface run-off to downgradient surface water and sediment, as well as uptake by biota from surface water and sediment and trophic transfer to upper trophic level receptors will be evaluated as potential transport pathways at SWMU 28.

**Evaluation of the Response to EPA Specific Comment 7 (October 3, 2011):** *The response mainly addresses the comment. The presence of hydric soils and vegetation indicators are useful to delineate wetland boundaries, regardless of the season or the presence of surface water. However, the Work Plan should acknowledge that it may not be possible to directly evaluate surface water as an exposure pathway*

*to benthic organisms in the wetlands if sampling occurs in the dry season, when surface water may be absent from the wetlands. Omitting this pathway would affect aspects of the risk characterization. Revise the Work Plan to address this issue.*

**Navy Response to Evaluation of the Response to EPA Specific Comment 7 (October 13, 2011):** Section 5.3.1.2 will be revised to address EPA concerns regarding the surface water exposure pathway. Specifically, the following paragraph will be added to the existing text within this section:

It is acknowledged that saturated sediments and surface water may not be found within the area of investigation if sampling activities are conducted during the dry season (lowest average monthly rainfall totals at NAPR occur from January through April [<http://www.weatherbase.com/index.php3?set+us>]). As discussed in Section 3.2.1, the E2FO3 wetland boundary adjacent to SWMU 28 will be field delineated in accordance with the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Caribbean Islands Region* (USACE, 2009). The field delineation process will include an evaluation of hydric soil and vegetation indicators, as well as hydrology indicators. The hydrology indicators evaluated will be those listed in the USACE document identified above, including water marks (i.e., discoloration) and sediment deposits on the bark of woody vegetation or other fixed objects, water-stained leaves, aquatic fauna (live individuals or dead remains), surface soil cracks that form when fine-grained or organic sediments dry and shrink, sparsely vegetated concave surfaces, and drainage patterns. If proposed sampling points are located within the field delineated boundary of the E2FO3 wetland and standing water is present, overland transport of chemicals with surface soil via surface run-off to downgradient surface water and sediment, as well as uptake by biota from surface water and sediment and trophic transfer to upper trophic level receptors will be evaluated as potential transport pathways at SWMU 28. If standing water is not present at the time of sampling, and sampling activities at the SWMU are conducted during the dry season (i.e., January through April), the hydrology indicators identified above will be evaluated to determine if transport pathways to surface water and sediment warrant consideration by the ERA. The absence of hydrology indicators within the area of investigation would indicate that standing water is not present during the wet season. In this case, the ERA will conclude that transport pathways to surface water and sediment are incomplete. However, if hydrology indicators are observed, the ERA will conclude that standing water is likely present during the wet season. In this case, the lack of surface water analytical data will be identified as a data gap. To address this data gap, the ERA will recommend a sampling event that coincides with the wet season.

**EPA Specific Comment 8: Section 5.3.3 Selection of Receptors, Page 5-14 (April 19, 2011):** *The second sentence in the first full paragraph states the following: “For a given SWMU, if suitable foraging habitat (i.e., habitat with fruit-bearing and/or flowering vegetation) is present within the area of investigation, individual bat species will be considered for inclusion as ecological receptors in the ERA.” Specify how far from the boundaries of each SWMU fruit-bearing and/or flowering vegetation would need to be located in order to be considered as suitable foraging habitat within the area of investigation. Also, clarify if the presence of any fruit-bearing and/or flowering vegetation versus known food sources for bats would cause bats to be included in food chain modeling. Finally, specify how fruit-bearing and/or flowering vegetation will be identified if the field investigations occur outside of the fruit-bearing and/or flowering season. Amend the text accordingly.*

**Navy Response to EPA Specific Comment 8 (June 23, 2011):** Section 5.3.3 (Page 5-14) of the draft work plan states that, “For a given SWMU, if suitable foraging habitat (i.e., habitat with fruit-bearing and/or flowering vegetation) is present within the area of investigation, individual bat species will be considered for inclusion as ecological receptors in the ERA.” The portion of this statement within the parentheses will be revised to define suitable foraging habitat as habitat with fruit-bearing and/or flowering vegetation known to be used as a source of food by bats in Puerto Rico. Plants used as food by

bats in Puerto Rico will be identified from the list contained in *Bats of Puerto Rico: An Island Focus and a Caribbean Perspective* (Gannon et al., 2005).

With regard to how far from the boundaries of each SWMU fruit-bearing and/or flowering vegetation would need to be located in order to be considered suitable foraging habitat within the area of investigation, the Navy offers the following points of clarification. As evidenced by Figure 3-1, samples will be collected from the E2SS3 wetland unit east of the SWMU 27 sludge drying beds. Samples also will be collected from the E2FO3 wetland unit east of the SWMU 28. Finally, proposed samples will be collected from a coastal scrub forest community east of the SWMU 29 sludge drying beds (note that the figure showing proposed sample locations at SWMU 29 [i.e., Figure 3-3] does not include the boundary of the coastal scrub forest community). These three figures also show historical sample locations (i.e., locations sampled during the Phase I and Full RFIs). If fruit-bearing and/or flowering vegetation at a given SWMU is located within the area encompassed by previous and proposed sample locations, and if bats are known to use this vegetation as a source of food in Puerto Rico, then the area of investigation will be considered to represent suitable foraging habitat for frugivorous and/or nectivorous bats. For clarification, the draft work plan statement identified in the preceding paragraph will be revised to clarify that the area of investigation refers to the area encompassed by previous and proposed sample locations.

The absolute presence of fruit or flowers on vegetation at the time field work is conducted will not be used as the basis for determining if suitable foraging habitat for bats is present. This determination will be based on the actual vegetation encountered within the area of investigation, and if the vegetation includes plants that are known to be used as a source of food in Puerto Rico (see first to paragraphs of the Navy response above) fruit-bearing or flowering. Vegetation at each SWMU will be identified in the field by individuals with knowledge of the flora present at NAPR. Field identification will be aided by appropriate field guides including:

- Kirk, T.K. 2009. Tropical Trees of Florida and the Virgin Islands: A Guide to identification, Characteristics and Uses. Pineapple Press, Inc., Sarasota, FL. 208 pp.
- Seddon, S.A. and G.W. Lennox. 1980. Trees of the Caribbean. Macmillan Publishers Ltd., London and Basingstoke, ENG. 74 pp.
- Kingsbury, J.M. 1988. 200 Conspicuous, Unusual, or Economically Important Tropical Plants of the Caribbean. Bullbrier Press, Ithaca, NY.

If a particular plant cannot be identified in the field, pictures will be taken and, if appropriate, samples will be collected (e.g., leaf samples) for identification using additional sources of information, such as the U.S. Department of Agricultural (USDA) Natural Resources Conservation Service (NTCS) Plant database (<http://plants.usda.gov/java/>). Section 5.3.3 (page 5-14) of the draft work plan will be revised to indicate how fruit-bearing and flowering vegetation will be identified in the field.

**Evaluation of the Response to EPA Specific Comment 8 (October 3, 2011):** *The response partially addresses the comment. However, the text in Section 5.3.3 has not been revised to indicate how fruit-bearing and flowering vegetation will be identified in the field. Revise the Work Plan to include this information.*

**Navy Response to Evaluation of the Response to EPA Specific Comment 8 (October 13, 2011):** Section 5.3.3 will be revised to include text indicating how fruit-bearing and flowering vegetations will be identified in the field. Specifically, the following will be added to the text in Section 5.3.3:

Vegetation at each SWMU will be identified in the field by individuals with knowledge of flora present at NAPR. Field identification will be aided by appropriate field guides, including:

- Tropical Trees of Florida and the Virgin Islands: A Guide to identification, Characteristics and Uses (Kirk, 2009).
- Trees of the Caribbean (Seddon and Lennox, 1980)
- Conspicuous, Unusual, or Economically Important Tropical Plants of the Caribbean (Kingsbury, 1988)

If a particular plant cannot be identified in the field, pictures will be taken and, if appropriate, samples will be collected (e.g., leaf samples) for identification using additional sources of information, such as the U.S. Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) Plant database (<http://plants.usda.gov/java/>).

References:

Kingsbury, J.M. 1988. 200 Conspicuous, Unusual, or Economically Important Tropical Plants of the Caribbean. Bullbrier Press, Ithaca, NY.

Kirk, T.K. 2009. Tropical Trees of Florida and the Virgin Islands: A Guide to identification, Characteristics and Uses. Pineapple Press, Inc., Sarasota, FL. 208 pp.

Seddon, S.A. and G.W. Lennox. 1980. Trees of the Caribbean. Macmillan Publishers Ltd., London and Basingstoke, ENG. 74 pp.

***EPA Specific Comment 9: Section 5.3.3 Selection of Receptors, Page 5-14 (April 19, 2011):*** *The last sentence in the first full paragraph states the following: "While insectivorous bats may potentially feed on flying insects which spend part of their life cycle living in soil/sediment, the exclusion of aerial insectivorous mammals from Eco-SSL development by the USEPA supports the presumption that insectivorous bats would not be expected to have any appreciable exposure to chemicals in soil (or sediment) at SWMUs 27, 28, and 29." The argument put forth in this sentence applies only to soil since the EcoSSLs refer only to soil. Sediment in aquatic habitats can be a source of winged aquatic insects for avian and mammalian insectivores. Amend the text such that it refers only to soil. Also, provide site-specific considerations (e.g., lack of permanent freshwater aquatic habitats at or around the three SWMUs) to support removing insectivorous bats from further consideration.*

**Navy Response to EPA Specific Comment 9 (June 23, 2011):** The text within the first paragraph on Page 5-14 of the draft work plan will be revised to remove any reference to sediment. As aquatic habitat can serve as a source of food for aerial insectivorous bats and birds (i.e., winged adult stage of aquatic insects), a new paragraph also will be added to Section 5.3.3 (beneath the paragraph referenced above) that includes site-specific information that further supports the exclusion of aerial insectivores from consideration at each SWMU. Revised/new text is shown below. It is noted that the revised text also addresses the Navy response to EPA Specific Comment No. 8, as well as the Navy response to PREQB Page-Specific Comment 21.

Although habitat within the boundary of each SWMU is limited to maintained/manicured lawns (see Figures 5-4, 5-5, and 5-6), adjacent habitats may present foraging opportunities for fruit-eating and/or insectivorous bats. For a given SWMU, if suitable foraging habitat (i.e., habitat with fruit-bearing and/or flowering vegetation known to be used as a source of food by bats in Puerto Rico) is present within the area of investigation (area encompassed by Phase I and Full RFI sample locations, as well as proposed CMS sample locations), individual bat species will be included as ecological receptors in the ERA. If chosen for evaluation, receptor-specific parameter values (e.g., body weights and food

ingestion rates) will be provided as part of each SWMU-specific ERA. It is noted that aerial insectivorous bats and birds will not be considered for evaluation at SWMUs 27, 28, and 29. As discussed in Guidelines for Developing Ecological Soil Screening levels (USEPA, 2005a), aerial insectivorous birds and mammals are excluded from Eco-SSL development because they are considered inappropriate (i.e., they do not have a clear direct or indirect exposure pathway link to soil [direct exposure pathways involve ingestion of soil-dwelling biota and incidental ingestion of soil as a result of foraging at the soil surface, while indirect exposure pathways involve ingestion by carnivores of prey that have direct contact with soil]). While aerial insectivores may potentially feed on flying insects which spend part of their life cycle living in soil, the exclusion of aerial insectivores from Eco-SSL development by the USEPA supports the presumption that insectivorous bats and birds would not be expected to have any appreciable exposure to chemicals in soil at SWMUs 27, 28, and 29.

Aerial insectivores also are not expected to have any appreciable exposure to chemicals in sediment at SWMUs 27, 28, and 29. As discussed in Section 5.1.2, aquatic habitats contiguous to SWMUs 27 and 28 consist of estuarine wetlands (E2SS3 wetland immediately east of SWMU 27 and E2FO3 wetland immediately east of SWMU 28). The Caribbean Sea also borders SWMU 27 to the south. There are no freshwater aquatic habitats within or contiguous to SWMUs 27 or 28, nor are there freshwater habitats within or contiguous to SWMU 29. Despite being well established in freshwater environments, aquatic insects are poorly represented in marine systems. Based on the lack of freshwater aquatic habitats at and contiguous SWMUs 27, 28, and 29, it can be concluded that suitable aquatic habitat is lacking for the establishment of a freshwater aquatic community that includes aquatic insects. Therefore, the sediment-aquatic insect larvae-flying adult insect-aerial insectivore exposure pathway does not warrant consideration as a complete exposure pathway at each SWMU.

***EPA Specific Comment 10: Section 6.2.1 Data Evaluation, Page 6-2; Section 6.3.3, Identification of Potential Exposed Human Populations, Page 6-5; and Figure 6-1: Conceptual Site Model (April 19, 2011):*** *These sections do not provide enough detail. Revise the CMS Work Plan to provide further clarification with respect to how data reflective of varying soil horizons will be grouped as the basis of exposure point concentrations (EPCs). Surface soil is defined as 0-1 ft below ground surface (bgs). Subsurface soil is defined as soil below 1 ft bgs. Total soil is defined at 0-10 ft bgs. The CMS Work Plan seems to imply that the relevant soil horizons for all pertinent and potentially exposed receptor populations include total soil (0-10 ft bgs). It is suggested that the following soil horizons be considered as reflective of relevant receptor populations:*

- a. *Trespassers: 0-1 ft bgs*
- b. *On-site generic industrial workers: 0-1 ft bgs*
- c. *Construction workers: 0-10 ft bgs*
- d. *Residential adult/child: Two discrete soil EPCs:*
  - i. *Surface soil only (reflective of the great majority of likely direct contact exposures): 0-1 ft bgs, and*
  - ii. *Total soil (reflective of contact associated with home repair, home gardening, etc.): 0-10 ft bgs.*

*If it can be demonstrated that derivation of all relevant soil EPCs predicated on total soil datasets reflect a more conservative basis for use in addressing potential direct contact with soil for all relevant receptor populations (i.e., increasing concentrations with depth), then it is amenable to the use of a single EPC based on total soil. Note that this may be slightly misleading in the review and selection of remedial alternatives although the nature and extent characterization will more fully define stratification of constituents in soil.*

**Navy Response to EPA Specific Comment 10 (June 23, 2011):** The Navy partially agrees with this comment. Although it is considered likely that the surface and subsurface soil will be reworked in the event the property is developed in the future, it is recognized that there is still potential for exposure to the top layer of soil. As such, the proposed approach for the SWMU 28 HHRA will be revised as follows. In order to conservatively account for potential exposure to surface soil (0 to 1 foot bgs) and total soil (0 to 10 feet bgs), COPCs will be selected from both surface soil and total soil. ProUCL will be used to calculate 95% UCLs (in the “with NDs” mode, as applicable) for the surface soil and total soil COPCs, and the higher of the two EPCs for each COPC will be used in the risk calculations to produce a conservative risk estimate. For COPCs having less than four detected concentrations or less than eight samples in the dataset, the maximum detected concentration will be used as the EPC for that data grouping.

The following discussion will be added to Section 6.2.1:

For the evaluation of soil exposure in the HHRA, it is recognized that for some receptor groups the potential for exposure would be primarily to the top layer of soil, even though it is considered likely that the surface and subsurface soil will be reworked in the event of future property development. Therefore, two soil data sets will be used to evaluate this exposure pathway: surface soil (0 to 1 foot bgs) and total soil (0 to 10 feet bgs). COPCs will be selected from both surface soil and total soil data sets, and exposure point concentrations (EPCs) will be determined for each COPC. The higher of the two EPCs for each COPC will be used in the risk calculations to produce a conservative risk estimate.

The following discussion will be added to Section 6.3.3:

It is recognized that for some receptor groups the potential for exposure would be primarily to the top layer of soil, even though it is considered likely that the surface and subsurface soil will be reworked in the event of future property development. Therefore, two soil data sets will be used to evaluate this exposure pathway: surface soil (0 to 1 foot bgs) and total soil (0 to 10 feet bgs). COPCs will be selected from both surface soil and total soil data sets, and exposure point concentrations (EPCs) will be determined for each COPC. The higher of the two EPCs for each COPC will be used in the risk calculations to produce a conservative risk estimate.

The following discussion will be added to Section 6.3.4:

As previously discussed, it is considered likely that the surface and subsurface soil will be reworked in the event the property is developed in the future. However, it is recognized that there is still potential for exposure to the top layer of soil. Therefore, in order to conservatively account for potential exposure to surface soil (0 to 1 foot bgs) and total soil (0 to 10 feet bgs), COPCs will be selected from both surface soil and total soil. ProUCL will be used to calculate 95% UCLs (in the “with NDs” mode, as applicable) for the surface soil and total soil COPCs, and the higher of the two EPCs for each COPC will be used in the risk calculations to produce a conservative risk estimate. For COPCs having less than four detected concentrations or less than eight samples in the dataset, the maximum detected concentration will be used as the EPC for that data grouping.

Figure 6-1 will be revised to change the secondary source from “total soil” to “soil.”

**EPA Specific Comment 11: Section 8.1.2, Establishment of Corrective Action Objectives, Page 8-1 (April 19, 2011):** *The CMS Work Plan does not provide an appropriately detailed discussion regarding how Corrective Action Objectives (CAOs) will be developed as outlined in the ANPR 1996, which refers to CAOs as media cleanup standards (MCSs). Revise this section to provide a more detailed outline that is more consistent with the approach detailed in Section III.C.5.c and Section III.C.5.g of the ANPR 1996.*

**Navy Response to EPA Specific Comment 11 (June 23, 2011):** Please see the Navy's Response to EPA Specific Comment 6. The text in Section 8.1.2 reflects the specific requirements for CAO establishment as given in the §7003 Administrative Order. However, the following will be added to the end of Section 8.1.2 to direct the reader toward discussions of site-specific risk based CAOs:

The development of site specific, risk-based CAOs protective of ecological and human receptors is discussed in detail in Section 5.10 – Development of Ecological Corrective Action Objectives and Section 6.7 – Human Health Corrective Action Objectives.

**EPA Specific Comment 12: Table 5-15, Exposure Parameters for Upper Trophic Level Receptors: Step 2 Screening Level Risk Calculation (April 19, 2011).** Footnote (7) states that "Food and drinking water ingestion rates for avian receptors were calculated using maximum body weights." Table 5-15 references body weight values which represent a minimum body weight; these values should be used in the food ingestion rate and drinking water ingestion rate calculations. Using a minimum body weight will result in a more conservative food ingestion and water ingestion rate. Recalculate food ingestion and water ingestion rates using the values for a minimum body weight given in Table 5-15, and remove footnote (7).

**Navy Response to EPA Specific Comment 12 (June 23, 2011):** The Navy respectfully disagrees with this comment and offers the following points of clarification. Maximum body weights, not minimum body weights, will result in more conservative (i.e., higher) food and water ingestion rates for each receptor species (for a given receptor, the higher the food and water ingestion rates, the higher the estimated dose). Using the green heron as an example, a maximum body weight of 0.220 kg (value identified in Footnote No. 7) gives a food ingestion rate of 0.02139 kg/day-dry weight and a water ingestion rate of 0.02139 L/day, while a minimum body weight of 0.138 kg (value listed in Table 5-15) gives a food ingestion rate of 0.01865 kg/day-dry weight and a water ingestion rate of 0.01565 L/day. As the more conservative approach was used to derive food and water ingestion rates, revisions to Table 5-15 are not deemed necessary.

**Evaluation of the Response to EPA Specific Comment 12 October 3, 2011):** *The response does not adequately address the comment. The response is correct that using receptor-specific maximum body weights and associated ingestion rates result in higher calculated doses compared to using minimum body weights and their associated ingestion rates. However, when the calculated ingestion rates are plugged into the dietary intake equation in Section 5.5.2.2.2, in which body weight is the divisor, using the minimum body weight will result in a higher (i.e., more conservative) dietary intake than if the maximum body weight were used. In order to be conservative, the minimum body weights for each receptor species should be used to calculate food and water ingestion rates. This recommendation is supported by EPA's 1997 Ecological Risk Assessment Guidance document (EPA 540-R-97-006) which states: "Body weight and food ingestion rate: minimum body weight to maximum ingestion rate" (see Section 2.2.1, Exposure Parameters for Screening-Level Exposure Estimates, p. 2-2). Revise the Work Plan to recalculate food ingestion and water ingestion rates using the values for a minimum body weight and a maximum ingestion rate to support the screening-level risk calculations. Central tendency adult body weights and ingestion rates can then be used in the Step 3.a refinement, as stated in Section 5.9.1 of the Work Plan.*

**Navy Response to Evaluation of the Response to EPA Specific Comment 12 (October 13, 2011):** The Navy disagrees with this comment. Specifically, the Navy disagrees with the statement in the EPA evaluation that, "In order to be conservative, the minimum body weights for each receptor species should be used to calculate food and water ingestion rates". Use of minimum body weights in the derivation of water and food ingestion rates will result in less conservative ingestion rates. To demonstrate this fact, calculations are provided below for green heron water and food ingestion rates using minimum

and maximum body weights.

#### Water Ingestion Rate

Water ingestion rates for the green heron were derived using an allometric equation from Calder and Braun (1983) for all birds (see Table 7-15):  $0.059(BW)^{0.67}$

Use of a minimum body weight in this allometric equation (i.e., 0.138 kg; see Table 7-15) gives a water ingestion rate of **0.01565 L/day**

Use of a maximum body weight in this allometric equation (i.e., 0.220 kg; see Footnote No. 7 in Table 7-15) gives a water ingestion rate of **0.02139 L/day**.

#### Food Ingestion Rate

Food ingestion rates for the green heron were derived using an allometric equation from Nagy (2001) for all birds (see Table 7-15):  $[0.638((BW*1000)^{0.685})]/1000$

Use of a minimum body weight in this allometric equation (i.e., 0.138 kg; see Table 7-15) gives a water ingestion rate of **0.01865 kg/day**

Use of a maximum body weight in this allometric equation (i.e., 0.220 kg; see Footnote No. 7 in Table 7-15) gives a water ingestion rate of **0.02567 kg/day**.

These calculations clearly show that use of maximum body weights will result in more conservative (i.e., higher) water and food ingestion rates. It is noted that the maximum body weights provided in Footnote No. 7 of Table 7-15 will only be used in the SERA to derive water and food ingestion rates. As specified within Section 5.5.2.2.2, the receptor body weights applied to the dietary intake equation will be the minimum body weights listed in Table 7-15.

In summary, when maximum water and food ingestion rates (derived using maximum body weights), as well as the minimum body weights (those listed within Table 7-15), are applied to the dietary intake equation presented in Section 5.5.2.2.2 of the Work Plan, a more conservative (i.e., higher) dietary intake will be calculated. Based on the discussion presented above, revisions to the document are not warranted.

#### **EPA MINOR COMMENTS**

***EPA Minor Comment 1: Section 6.2.3, COPC Selection Criteria, Page 6-3 (April 19, 2011):** Although specifically noted in Table 6.1, any forthcoming revision of the CMS Work Plan text should specify use of the residential Soil Regional Screening Levels as the preferred screening criteria for use in evaluating analytical results for soil.*

**Navy Response to EPA Minor Comment 1 (June 23, 2011):** The following text will be added to the first paragraph:

Specifically, for the purpose of COPC selection in the HHRA, residential soil SLs will be used for soil and sediment data, and tap water SLs will be used for groundwater and surface water data.

**EPA Minor Comment 2: Section 6.5, Risk Characterization, Page 6-8 (April 19, 2011):** The approach as outlined is correct, however, it does not fully address all relevant pathways, most notably inhalation. While the overall quality of the Human Health Risk Assessment Work Plan (HHRA WP) component is well organized, any forthcoming revision of the document should include a discussion of quantification of inhalation exposures, inclusive of inhalation unit risk and reference concentration toxicity criteria. It is preferred that the quantification of inhalation hazard to be predicated on the reference concentration, rather than conversion to an inhalation reference dose

**Navy Response to EPA Specific Comment 2 (June 23, 2011):** The following text will be added to Section 6.5:

After the second paragraph:

As put forth in RAGS Part F (USEPA, 2009), for evaluation of the inhalation pathway, the potential lifetime ILCR for an individual was estimated from the following relationship:

$$ILCR = \sum_{i=1}^n EC_i \times IUR_i \times 10^3 \mu g / mg$$

IUR is expressed as  $(\mu g/m^3)^{-1}$  for compound i, and the exposure concentration (EC) is expressed in  $mg/m^3$  for compound i. The ILCR value here is also dimensionless such that the inhalation risks can be summed with the ingestion and dermal contact risks to yield a total risk over all potential pathways.

After the third paragraph:

As put forth in RAGS Part F (USEPA, 2009), for evaluation of the inhalation pathway, the HQ was estimated using the equation:

$$HQ_i = \frac{(EC_i)}{RfC_i} \quad (\text{inhalation})$$

The RfC is expressed as  $mg/m^3$  for compound i, and the EC is expressed in  $mg/m^3$  for compound i. The HQ value here is also dimensionless such that the inhalation risks can be summed with the ingestion and dermal contact risks to yield a total risk over all potential pathways.

**EPA Minor Comment 3: Table 5-8, Soil to Plant and Soil to Earthworm Bioaccumulation Factors and Bioaccumulation Uptake Equations for the Estimation of Chemical Concentrations in Terrestrial Plant and Invertebrate Tissue: Step 2 Screening Level Risk Calculation (April 19, 2011):** Footnote (10) references Table 7-3 for  $K_{ow}$  and  $K_{oc}$  values to be used in the BAF equation. Table 7-3 does not exist in the CMS Work Plan. Table 5-3, Log  $K_{ow}$  and  $K_{oc}$  Values for Organic Chemicals should be referenced instead. The footnote should be corrected accordingly.

**Navy Response to EPA Minor Comment 3 (June 23, 2011):** The reference to Table 7-3 in Footnote No. 10 of Table 5-8 will be changed to Table 5-3.

**EPA Minor Comment 4: Table 6-2, Summary of Exposure Parameters (April 19, 2011):** The parameter values for Ingestion rate of surface water appear to be cut off by the table print dimensions. Please provide the preferred values, or revise the table in any forthcoming iteration of the document.

**Navy Response to EPA Specific Comment 4 (June 23, 2011):** The second entry for ingestion rate of surface water at the top of page 2 of Table 6-2 is a typographical error and will be deleted. The correct entry is located at the bottom of page 1 of the table.

## **PREQB COMMENTS**

### **I. GENERAL COMMENTS**

**PREQB General Comment 1 (April 19, 2011):** *In review of the data from the previous investigations (Phase I RFI and full RFI) at each SWMU, it was noted that the nondetect results for metals were consistently reported down to the reporting limit in the 2006 Phase I RFIs and consistently reported down to the method detection limit (MDL) in the 2008 full RFIs. All language in Sections 5.5.1, 5.5.2 and 5.6 of the CMS Work Plan consistently state that reporting limits will be used in the risk assessments. Typically, the MDL is a statistically derived value that is not accurately verified by the laboratory analysis. The reporting limits (or quantitation limits) are accurately verified by laboratory analyses of standards at the unadjusted reporting limit. Table 3-2 of the CMS Work Plan presents the quantitation limits that the laboratory is required to achieve, and not the MDLs. It is PREQB's preference to follow USEPA's "Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part A)", a primary reference that states, " ... Because [sample quantitation limits (SQLs)] take into account sample characteristics, sample preparation and analytical adjustments, these values are the most relevant [quantitation limits] for evaluating non-detected chemicals." Please confirm that the laboratory will be reporting all nondetect results down to the quantitation limit and not the MDL for the investigation associated with the CMS. Please have all data from the 2008 RFI revised to be reported down to the quantitation limit instead of the MDL in order to be consistent with the 2006 Phase I data and to meet the data quality objectives for risk assessment.*

**Navy Response to PREQB General Comment 1 (June 23, 2011):** TestAmerica Savannah's process for performing MDL studies is outlined in laboratory SOP SA-QA-007: *Determination and Verification of Detection and Reporting Limits*. This process is performed in accordance with the 40CFR Part 136 Appendix B procedure and includes determining a statistical MDL value using the standard deviation of results from the analysis of a minimum of 7 replicates spiked near the reporting limit. The laboratory has also adopted an MDL verification procedure such that this statistical MDL value is verified via an MDL verification sample and the long term evaluation of method blanks. This verification procedure ensures the laboratory's MDL values are reasonable, consistently recovered, and at least 3 times the background noise. The laboratory's MDL study, MDL verification data, and SOPs are available for review upon request.

The convention for evaluating non-detect values to the MDL is a common industry-wide laboratory practice. This convention is consistent with that outlined in the Department of Defense Quality Systems Manual (DOD QSM) and several other state requirements, including the Florida Department of Environmental Protection, FLDEP, who issues the laboratory's NELAC certification upon which our Puerto Rico certification is based.

Based on the above, no revisions to the text or tables are proposed. This issue is currently awaiting resolution pending the outcome of the Response to Comment Letter for the Draft Phase I RFI for SWMU 60 (Former Landfill at the Marina) dated September 25, 2009. Once this issue is resolved, the final response will be applied to this document. The Navy position is that no revisions to the text or tables are proposed.

*PREQB Evaluation of Response (August 12, 2011): PREQB understands that this issue is awaiting resolution from EPA. Please note that the reporting of nondetects to the MDL is not consistent with the*

DoD QSM, as indicated in the response. Current DoD guidance requires the reporting of limits of detection (LODs), which are higher than MDLs (or DLs, as referenced in the DoD guidance) and are also analytically verified. Please refer to the following link for clarification on the DoD requirements as well as a discussion on the limitations and uncertainty associated with the reporting of nondetects down to the MDL. PREQB requests that the nondetect results be reported down to the LOD, at a minimum, and not the MDL.

<http://www.navylabs.navy.mil/Final%20DQ%20Fact%20Sheet%20091409.pdf>

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** This issue of reporting non-detects to the MDL on the existing documents has been resolved with the Navy's July 22, 2011 submission of the Final Phase I RCRA Facility Investigation Report for SWMU 60 and the EPA approval dated July 28, 2011. Moving forward, analytical data will be reported as follows: non-detects will be reported down to the LOD, estimated values will be reported below the LOQ, and positive values are above the LOQ (this procedure was first implemented for analytical data generated for the April 2011 field sampling events). Existing analytical data (where non-detects are reported to the MDL) that has already been submitted to EPA will not be revised. No revisions are required for the CMS Work Plan for SWMUs 27, 28 and 29.

## II. PAGE-SPECIFIC COMMENTS

**PREQB Page-Specific Comment 1 (April 19, 2011):** Page 1-2, Section 1.2:

**PREQB Page-Specific Comment 1a (April 19, 2011):** Please expand the background discussion for each SWMU addressed to include construction details (thickness of concrete walls and floors, storage capacity, depth, etc.) of each of the sludge beds. Understanding the construction details of the beds may impact the eventual screening of remedial technologies, as appropriate.

**Navy Response to PREQB Page-Specific Comment 1a (June 23, 2011):** Many of the details regarding construction of the sludge drying beds are not available. All beds are constructed of concrete. The aerial coverage of the SWMU 27 sludge beds is 9,776 square feet, the SWMU 28 sludge beds is 5,742 ft<sup>2</sup> and 7,946 ft<sup>2</sup>, the SWMU 29 sludge beds is 21,014 ft<sup>2</sup>. Information is not available on the thickness of the concrete walls and floors of each sludge bed. The aerial coverage information will be included in Sections 1.2.1, 1.2.2 and 1.2.3, as appropriate.

*Technical Evaluation of Navy Response to PREQB Page-Specific Comment 1a (August 12, 2011).* It would appear the lack of information on the construction of the beds increases the need for data relative to the potential for releases to occur within the footprints of the beds (i.e., leaks/percolation through the bed bottom). Efforts to date have been focused on the evaluation of the potential for releases which may have occurred adjacent to the beds. Please address the adequacy of the site characterization with respect to whether releases have occurred beneath the sludge drying beds.

**Navy Response to PREQB Evaluation of Navy Response (October 13, 2011):** Sampling has not been conducted, nor is sampling proposed in the CMS Investigation directly beneath the sludge drying beds to preserve the integrity of the beds so that they may be used in the future use as sludge drying beds. Since the sludge drying beds at each SWMU are acting as an engineered cap over the soil beneath the beds thereby eliminating any direct contact human health or ecological exposure pathways, the Phase I and Full RFIs were specifically designed to collect samples from the perimeter and from locations as close as possible to the edge of the drying beds. Past releases to the surface or shallow subsurface soil will be detected from these perimeter monitoring points and any contamination in the subsurface soil or groundwater also will be identified. The CMS Report will however, specifically identify that samples

from directly beneath the sludge drying beds have not been collected or evaluated. Additionally, a new section will be added to the CMS Investigation Work Plan that indicates that the integrity of the sludge drying beds will be visually evaluated:

### **3.6.8 Sludge Drying Bed Visual Inspection**

A visual inspection of the sludge drying beds at each SMWU will be performed to document the current conditions and integrity of the beds. Beds will be inspected for cracks and holes and other signs of deterioration. Results will be recorded in the field logbook. Photographs of the beds also will be taken to document bed condition at the time of the CMS Investigation. Appropriate documentation and photographs will be provided as an appendix to the CMS Investigation Report.

***PREQB Page-Specific Comment 1b (April 19, 2011):*** Please revise the background discussions and any associated figures to identify any features such as piping, etc. used to convey the sludge materials into and out of the beds, and identify the eventual disposal site of the sludge produced after sufficiently dry. The investigation of the beds and sludge as sources of contamination needs to address all appurtenant features where releases may have occurred.

**Navy Response to PREQB Page-Specific Comment 1b (June 23, 2011):** Refer to the Navy Response to PREQB Page-Specific Comment 1a. When the Base was in operation, all sludge from the sludge drying beds went to the Base Landfill. Since the base has closed, there has not been disposal of any sludge. Additionally, it is planned that there will be a land use control implemented on the sludge beds. The sludge beds will eventually be transferred to the PRASA (Sewage Authority) where they will continue to be used as sludge drying beds.

***PREQB Evaluation of Response (August 12, 2011):*** Please see PREQB's evaluation of response to comment 1a. Also, please clarify if sludge is present in the sludge drying beds and if so, please ensure that the sludge is removed and the sludge beds inspected for holes or cracks prior to land transfer.

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** Refer to the Navy Response to PREQB Page-Specific Comment 1a. Currently, there is no sludge in the sludge drying beds. Also, as indicated in the Navy Response to PREQB Page-Specific Comment 1a, the Work Plan will be revised to indicate that a visual inspection of the beds will be conducted to identify cracks, holes and/or deteriorating concrete and to document the current condition of the beds.

***PREQB Page-Specific Comment 2 (April 19, 2011):*** Page 1-3, Section 1.3:

*a. Please revise the text to state the objectives of the prior investigations and clarify why characterization of the sludge in the pits was not within the scope of investigations at these SWMUs. An investigation of the sludge drying pits themselves, including the soils and groundwater below the beds, was not conducted; rather it appears that the purpose of the prior investigations was to determine if releases occurred to the environment adjacent to the sludge drying pits. This appears consistent with the conceptual site models which only show exposure routes and transport pathways from soil adjacent to the pits.*

**Navy Response to PREQB Page-Specific Comment 2a (June 23, 2011):** The text of the third paragraph of Section 1.3 – Investigative History and Basis for the Work Plan will be revised to indicate that the focus of previous investigations was to determine whether there was a release to the environment adjacent to the sludge drying beds, as follows:

The RFIs at SWMUs 27, 28 and 29 were designed to determine if a release occurred to the environment adjacent to the sludge drying beds and identified various elements and compounds

above human health and ecological screening level criteria due to Navy activities (Baker 2007, 2008d and 2008e). Based on the RFI, Full RFI Investigations were recommended in order to better delineate site contamination above screening levels at all three SWMUs (27, 28 and 29), as well as evaluate the potential for human health and ecological risk.

*b. This section mentions that arsenic (in addition to mercury and zinc) was detected in surface soils at SWMU 27 during the RFI at concentrations in excess of background and screening levels. The figure depicting the exceedances in surface soils at SWMU 27 (Figure A1) does not reflect that arsenic was considered an exceedance -please clarify.*

**Navy Response to PREQB Page-Specific Comment 2b (June 23, 2011):** Arsenic was not detected at concentrations above both the background and screening levels in the SWMU 27 RFI. The text in Section 1.3 that refers to surface soil exceedances has been edited as follows:

Mercury and zinc were above their background values, as well as screening levels at multiple locations.

**PREQB Page-Specific Comment 3 (April 19, 2011):** *Page 1-4, Section 1.3.1, Paragraph 1: The text in this section references three chromium exceedances of background and screening levels in the subsurface soil at three locations at SWMU 27, yet Figure A2 indicates that, in addition to a fourth chromium exceedance, there were also copper and zinc exceedances. Please clarify.*

**Navy Response to PREQB Page-Specific Comment 3 (June 23, 2011):** The Navy concurs with this comment. The discussion of subsurface soil exceedances in Section 1.3.1 has been edited as follows:

The subsurface soil did not exhibit much contamination above background for compounds that exceeded the human health or ecological screening criteria, with the exception of chromium at four locations, zinc at two locations, and copper at one location (basewide background and ecological screening value exceedances).

**PREQB Page-Specific Comment 4 (April 19, 2011):** *Page 1-4, Section 1.3.2:*

*a. Paragraph 1: Please discuss all metals detected in the surface soils at SWMU 28 that exceeded background and one or more screening levels.*

**Navy Response to PREQB Page-Specific Comment 4a (June 23, 2011):** The second sentence of the first paragraph of Section 1.3.2 has been revised to include mention of all metals that were detected above background and one or more screening values. The sentence has been revised as follows:

Surface soil contamination in excess of background screening values and human health and/or ecological screening criteria consisted of Aroclor 1260, antimony, arsenic, barium, chromium, copper, lead, mercury, tin and zinc.

*b. Paragraph 3: The discussion of the exceedances of background and other screening criteria in this section is limited to barium, however, the figures contained in Appendix B show that there were other metals exceedances as well. For example, Figure B5 shows that lead and dissolved mercury exceed their respective MCLs at 28TW01. Note that MCL exceedances need to be addressed for all SWMUs. Please clarify.*

**Navy Response to PREQB Page-Specific Comment 4b (June 23, 2011):** Paragraph 3 and Figure B5 have been edited to address all exceedances of screening criteria during the Phase I RFI and the Full RFI in groundwater as follows:

Total barium (780 ug/L to 12,000 ug/L) and dissolved barium (330 J ug/L to 710 J ug/L) were detected in the groundwater samples collected from areas south and east of the sludge drying beds at levels in excess of background screening criteria and human health screening criteria, and in 28TW01 above the Federal Maximum Contaminant Levels (MCLs). In addition, from the groundwater sample collected at TW01 arsenic, barium, beryllium, chromium, lead, nickel, silver, vanadium, zinc and mercury were detected at concentrations above the basewide background screening levels as well as one or more of the following screening criteria: USEPA Region IX Tap Water PRGs, USEPA MCLs, or ecological surface water screening levels.

**PREQB Page-Specific Comment 5 (April 19, 2011):** *Page 1-6, Section 1.3.4: This section states " ... However, based on a review of the PRGs versus the Regional Screening Levels, it was expected that the results of the screening would not be significantly impacted and that the conclusions and recommendations of the Full RFIs would remain the same upon replacement of PRGs with the Regional Screening Levels ... " Please provide the supporting documentation for the comparison of Region 9 PRGs to current RSLs and clarify in the text whether the conclusions and recommendations are the same or are not the same (not whether they are expected to be the same) based on this comparison.*

**Navy Response to PREQB Page-Specific Comment 5 (June 23, 2011):** A general review of PRGs compared to the Regional Screening Levels was conducted for informational purposes when the RSLs were first released, to evaluate any differences in screening criteria. Supporting documentation is not available at this time, but it was noted that there were not many differences in screening criteria numbers for constituents that are routinely detected at SWMUs at NAPR. The Final Phase I RFIs and the Final Full RFIs for Sites 27, 28 and 29 were reviewed and approved by the USEPA; it is not the intent of this Work Plan to re-evaluate the data contained in the documents. However, current as well as historical data will be compared to the appropriate criteria as part of the CMS Investigation report.

**PREQB Page-Specific Comment 6 (April 19, 2011):** *Page 2-1, Section 2-1, paragraph 1: Please note that the human health risk assessment needs to evaluate complete and potentially complete exposure pathways. Therefore, please clarify the term "realistic" in the context of exposure pathways that will be evaluated. Note that Section 3.0 states that exposure pathways that may be present will be identified. Please reword this bullet to be consistent with Section 3.0.*

**Navy Response to PREQB Page-Specific Comment 6 (June 23, 2011):** The second bullet item under Section 2.1 will be revised to change the word "realistic" to "potential."

**PREQB Page-Specific Comment 7 (April 19, 2011):** *Page 3-1, Section 3.0: Please include discussions as well as the figures to support the understanding of the vertical extent of contamination at each SWMU. Data presented within the current CMS work plan does not include any information on soil quality at depths below 3 feet below ground surface (bgs). At any locations where contamination has been detected in the 1 to 3 foot bgs interval, there is no data presented to document this contamination does not extend deeper. Although exposure by ecological receptors is not anticipated below 3 feet bgs, evaluation of impacts within the vadose zone allows for the determination of whether soil is a source of contamination to groundwater.*

**Navy Response to PREQB Page-Specific Comment 7 (June 23, 2011):** Please refer to the USEPA approved Phase I and the Full RFIs for SWMUs 27, 28 and 29 for discussions on the nature and extent of contamination as well as conclusions and recommendations. The reports discuss in detail each sampling event for SWMUs 27, 28 and 29 as well as analytical results and comparisons to Human Health and Ecological Screening criteria, as well as if any concerns are evident or if further sampling is recommended. No edits are proposed.

## References:

Michael Baker Jr. Inc. (Baker), 2008a. Final Full RCRA Facility Investigation SWMU 27 – Capehart Wastewater Treatment Plant Sludge Drying Beds Naval Activity Puerto Rico, EPA ID No. PR2170027203, Ceiba, Puerto Rico. August 28, 2008.

Baker, 2008b. Final Full RCRA Facility Investigation SWMU 28 – Bundy Wastewater Treatment Plant Sludge Drying Beds Naval Activity Puerto Rico, EPA ID No. PR2170027203, Ceiba, Puerto Rico. August 28, 2008.

Baker, 2008c. Final Full RCRA Facility Investigation SWMU 29 – Industrial Area Wastewater Treatment Plant Sludge Drying Beds Naval Activity Puerto Rico, EPA ID No. PR2170027203, Ceiba, Puerto Rico. August 28, 2008.

**PREQB Evaluation of Response (August 12, 2011):** *Please refer to PREQB's evaluation of response to Comment 2a above.*

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** Please refer to the Navy Response to PREQB Evaluation of Response for Comments 1a and 2a. Characterization of the vertical extent of contamination is discussed in the Phase I and Full RFI Reports for each SWMU and in the appropriate sections of the Work Plan. For SWMUs 27 and 29, there were no exceedances of screening criteria and background in the subsurface soil at or below the three foot below ground surface depth requiring further delineation. For SWMU 28, only one location (28SB06) was identified with exceedances of screening criteria and background at the three feet below ground surface interval requiring further delineation. Sampling to delineate the vertical extent of contamination at this location is discussed in Section 3.2.2.2 of the Work Plan. No edits are proposed.

**PREQB Page-Specific Comment 8 (April 19, 2011):** *Page 3-2, Section 3.1.1: The CMS Work Plan states that the wetland/upland boundary will be used to determine whether samples collected in uplands/wetlands are designated as surface soil or sediment. The presence of jurisdictional wetlands should not be the determining factor regarding whether a sample is considered surface soil or sediment. If a sample is collected in a location where aquatic habitat is present within the wetland and that habitat could support aquatic organisms (e.g., aquatic invertebrates) then that sample should be considered sediment. However, if the sample is located within a terrestrial environment (i.e., aquatic habitat is not present), then that sample is more appropriately considered to be a soil sample (even if located within the delineated wetland). It is important to designate these samples correctly as ecological receptors and screening values will be significantly different between soils classified as soil or as sediment.*

**Navy Response to PREQB Page-Specific Comment 8 (June 23, 2011):** The Navy concurs with this comment. The following sentence will be deleted from Section 3.1.1:

This boundary will be established to determine if subsequent samples are designated as sediments samples or surface soil samples.

A statement will be added to Section 3.1.2.3 to clarify how the field team will distinguish between sediment and surface soil samples, as follows:

If field conditions indicate that the proposed samples should be classified as soil, the sampling program will be modified to reflect the change in media and surface and subsurface soil samples will be collected as discussed in Section 3.1.2.1 and 3.1.2.2.

**PREQB Page-Specific Comment 9 (April 19, 2011):** *Page 3-4, Section 3.1.2.3,*

*a. Paragraph 2: Please add turbidity to the field parameters measured as part of the surface water sampling event. Although aliquots will be collected for both total and dissolved metals, turbidity measurements aid in the interpretation of the data.*

**Navy Response to PREQB Page-Specific Comment 9a (June 23, 2011):** Turbidity has been added as a field parameter to be measured as part of the surface water sampling event.

*b. Paragraph 3: Please include chromium in the listing of metals in this paragraph in addition to mercury and zinc.*

**Navy Response to PREQB Page-Specific Comment 9b (June 23, 2011):** Chromium in surface soil at SWMU 27 was detected at concentrations above the ecological surface soil screening values but the concentrations were not detected above the NAPR basewide background values. Therefore, chromium will not be added to the listing of metals in addition to mercury and zinc in Section 3.1.2.3.

**PREQB Page-Specific Comment 10 (April 19, 2011):** *Page 3-6, Section 3.2.2.2: Figure B4 shows chromium was detected in subsurface soil at concentrations exceeding the current hexavalent chromium residential and industrial RSLs. Therefore, the CMS needs to determine whether hexavalent chromium is present at this SWMU.*

**Navy Response to PREQB Page-Specific Comment 10 (June 23, 2011):** The site (SWMU 28) consists of the domestic sewage treatment plant serving the Bundy area. Based on information available, this unit does not manage or generate RCRA hazardous wastes or constituents. Chromium hexavalent (CrVI) compounds, often called hexavalent chromium, exist in several forms. Industrial uses of hexavalent chromium compounds include chromate pigments in dyes, paints, inks, and plastics; chromates added as anticorrosive agents to paints, primers, and other surface coatings; and chromic acid electroplated onto metal parts to provide a decorative or protective coating. Hexavalent chromium can also be formed when performing "hot work" such as welding on stainless steel or melting chromium metal. In these situations the chromium is not originally hexavalent, but the high temperatures involved in the process result in oxidation that converts the chromium to a hexavalent state. The former and current use of SWMU 28 does not coincide with hexavalent chromium being a likely chemical of concern or being present at the SWMU. No edits to the work plan are proposed.

**PREQB Evaluation of Response (August 12, 2011):** *Please clarify in the text why hexavalent chromium is not of concern at this site, since data showing exceedances of the hexavalent chromium screening criteria is included in this document.*

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** Section 3.2 will be revised to include the following discussion:

Note that the soil and groundwater screening levels used for chromium are based on trivalent chromium rather than hexavalent chromium. Chromium hexavalent (CrVI) compounds, often called hexavalent chromium, exist in several forms. Industrial uses of hexavalent chromium compounds include chromate pigments in dyes, paints, inks, and plastics; chromates added as anticorrosive agents to paints, primers, and other surface coatings; and chromic acid electroplated onto metal parts to provide a decorative or protective coating. Hexavalent chromium can also be formed when performing "hot work" such as welding on stainless steel or melting chromium metal. In these situations the chromium is not originally hexavalent, but the high temperatures involved in the process result in oxidation that converts the chromium to a hexavalent state. The former and current use of SWMU 28 does not coincide with hexavalent chromium being a likely chemical of concern or being present at the SWMU. Consequently, the Regional Screening Levels selected for evaluating chromium are based on the more commonly occurring trivalent chromium.

**PREQB Page-Specific Comment 11 (April 19, 2011):** Page 3-7, Section 3.2.2.2, Bullet 2: Please clarify why the drilling will be terminated at nine feet below grade at locations 28SB16 -18.

**Navy Response to PREQB Page-Specific Comment 11 (June 23, 2011):** The Full RFI Report for SWMU 28 identified barium in the shallow subsurface soil (0 to 1 foot bgs depth interval) at location 28SB06 at concentrations exceeding human health and ecological screening criteria as well as background. However, samples from this same location from the 3.0 to 5.0 foot and 5.0 to 7.0 foot depth intervals did not exhibit exceedances of criteria for barium indicating that the contamination is confined to the surficial soil. The sampling program is designed to confirm that barium is confined to the surficial soil with the collection of surface and subsurface soil samples from three locations adjacent to 28SB06 with continuous sampling on two foot intervals to a depth of nine feet (which is the two-foot interval below the lowest interval from 28SB06).

**PREQB Page-Specific Comment 12 (April 19, 2011):** Page 3-8, Section 3.2.2.3, Bullet 2: Figure B8 shows that temporary well 28TW01 was advanced into the bedrock. As it has been stated that groundwater is present in the overburden at the SWMU 28 site, please install proposed well 28MW11 in the overburden rather than to a depth that straddles overburden and bedrock formations.

**Navy Response to PREQB Page-Specific Comment 12 (June 23, 2011):** Well 28MW11 will be installed so that the screen intercepts the most shallow groundwater underlying SWMU 28. The following will be added as the last sentence of the referenced bullet:

Note that although the borehole for 28TW01 was advanced into the weathered bedrock, the borehole for well 28MW11 will terminate at the overburden and weathered bedrock interface.

**PREQB Page-Specific Comment 13 (April 19, 2011):** Page 3-8, Section 3.2.2.3, Bullet 5: As the groundwater is present in the overburden materials, please clarify why well materials may be installed into an open borehole as stated in this bullet.

**Navy Response to PREQB Page-Specific Comment 13 (June 23, 2011):** The well will be installed so that the screen intercepts the most shallow groundwater underlying SWMU 28. The last sentence of this bullet has been revised to delete the open borehole reference, as follows: The well construction materials will be installed through the HSAs.

**PREQB Page-Specific Comment 14 (April 19, 2011):** Page 3-8, section 3.2.2.3, Bullets 6 & 7 Page 3-8, Section 3.2.2.3, Bullet 5: As the groundwater is present in the overburden materials, please clarify why well materials may be installed into an open borehole as stated in this bullet.

**Navy Response to PREQB Page-Specific Comment 14 (June 23, 2011):** See Navy Response to PREQB Page-Specific Comments 12 and 13.

**PREQB Page-Specific Comment 15 (April 19, 2011):** Page 3-8, section 3.2.2.3, Bullets 6 & 7: Please identify the proposed screen slot size to be used for well construction, as well as the size/grading of the sand pack to be used (e.g., 10slot screen with No.1 sand).

**Navy Response to PREQB Page-Specific Comment 15 (June 23, 2011):** The fourth sentence of the third paragraph and the eighth bullet of Section 3.2.2.3 have been revised as follows:

Well screens will be 10-feet long with a slot size of 0.010-inch (10 slot) and installed to straddle the water table.

- The annular space around the well screen will be backfilled with a well-graded, fine to medium sand (Standard Sand and Silica Co. 20 - 30 mesh size sand or equivalent) as the HSAs or casing are being withdrawn from the borehole. The sand will extend to approximately 2 feet above the top of the screened interval. The thickness of the sand above the screened interval may be reduced if the well is too shallow to allow for placement of adequate sealing material.

**PREQB Page-Specific Comment 16 (April 19, 2011):** *Page 3-10, Section 3.2.2.4, Paragraph 1: Please indicate the basis for the statement that it is anticipated that sediment and surface water samples will not be required for this site. Is this based on observations made during the previous deployments to SWMU 28?*

**Navy Response to PREQB Page-Specific Comment 16 (June 23, 2011):** The basis for the statement that surface water samples are not expected to be required is based on site conditions observed during both the Phase I RFI and the Full RFI. A statement has been added to the first sentence of the second paragraph as follows:

Up to ten surface water samples (28SW01 through 28SW10) may be collected. However, currently no surface water samples are anticipated at SWMU 28 due to the probable lack of water, based on previous site investigations.

**PREQB Page-Specific Comment 17 (April 19, 2011):** *Page 3-10 Section 3.2.2.4, Paragraph 2: Please add turbidity to the field parameters measured as part of the surface water sampling event. Although aliquots will be collected for both total and dissolved metals, turbidity measurements aid in the interpretation of the data.*

**Navy Response to PREQB Page-Specific Comment 17 (June 23, 2011):** Please see Navy Response to PREQB Page-Specific Comment 9a.

**PREQB Page-Specific Comment 18 (April 19, 2011):** *Page 3-14, Section 3.5.2, Paragraph 2: Please clarify if the 1-liter transfer bottle proposed for use in the collection of surface water samples (if surface water is present) is dedicated to each location or if it will undergo field decontamination procedures between locations. Particularly if it is not a dedicated piece of equipment, please include it, as appropriate, in the equipment rinsate regimen along with the other pieces of equipment.*

**Navy Response to PREQB Page-Specific Comment 18 (June 23, 2011):** The 1-liter bottle proposed for the collection of surface water samples is dedicated to each sample location and samples will be collected using the direct dip method. The text concerning the collection of surface water samples (Section 3.2.2.4) has been revised as follows:

Up to ten surface water samples (28SW01 through 28SW10) may be collected. However, currently no surface water samples are anticipated at SWMU 28 due to the probable lack of water. Surface water samples (if present) will be collected using the direct-dip method from an appropriate water depth determined in the field. The direct dip method uses a 1-liter laboratory certified clean, unpreserved amber glass bottle.

Surface water sampling techniques include:

- Care shall be taken to minimize sediment disturbance while collecting surface water samples. If necessary, sediment samples shall be collected after the corresponding surface water sample.
- Samples may be collected either by immersing the approved sample container or decontaminated glassware into the water.

- Measurements for temperature, pH, specific conductance, turbidity, or other field parameters, as appropriate, shall be collected immediately following sample collection for laboratory analyses.
- For preserved sample containers, extreme care will be exercised to avoid overfilling or spilling the contents of the sample container and diluting the preservative.

Field filtration of surface water samples requires preparation and preservation of water samples for dissolved inorganics involving some form of filtration. The samples to be filtered will be collected in an approved non-preserved container. An additional sample will be collected to account for possible losses during the filtration process. The recommended method is through the use of a dedicated peristaltic pump, disposable polyethylene tubing and in-line filtration module (0.45 micron filter) utilizing the pressure provided by the pumping device to transfer sample from one container, through the filter and discharged into a clean approved preserved sampling container.

Filtration and preservation are to occur in the field on the same day as collected with the sample aliquot passing through a dedicated disposable 0.45 micron filter and polyethylene tubing. Samples for organic analyses shall never be filtered. To minimize the potential for suspending solids during sampling, surface water samples will be collected from downstream to upstream locations and prior to collection of the associated sediment samples.

***PREQB Page-Specific Comment 19 (April 19, 2011):*** Page 3-16, Section 3.6.5, Paragraph 1: Please change the acronym in the final sentence from "GSP" to "GPS".

**Navy Response to PREQB Page-Specific Comment 19 (June 23, 2011):** The acronym has been changed from "GSP" to "GPS" in Paragraph 1 of Section 3.6.5.

***PREQB Page-Specific Comment 20 (April 19, 2011):*** Page 4-2, Section 4.9, Paragraph 1: Please change the acronym in the final sentence from "COAs" to "CAOs".

**Navy Response to PREQB Page-Specific Comment 20 (June 23, 2011):** The acronym in the final sentence has been changed from "COAs" to "CAOs".

***PREQB Page-Specific Comment 21 (April 19, 2011):*** Page 5-14, Section 5.3.3: An aerial, insectivorous mammal (bat) was not selected as a receptor species to evaluate surface soil contaminants as the USEP A eco-SSL guidance indicates that these receptors are not appropriate for evaluating surface soil contaminants. The exclusion of a mammalian aerial insectivore as a receptor for evaluating surface soil contamination is justified; however, aerial, insectivorous birds and bats may be appropriate receptors for evaluating sediment contaminants since aquatic insects comprise a significant component of the diet of some birds and bats. Swallows and bats are often selected as appropriate receptors for evaluating effects of sediment contamination on avian/mammalian receptors. The USEPA eco-SSL guidance should not be used to presume that this potential sediment to aquatic invertebrate to aerial insectivore exposure pathway is not complete as it represents a totally different pathway (i.e., sediment-aquatic insect larvae-adult insect swallow versus soil-earthworm-swallow). However, habitat conditions conducive to providing foraging areas for aerial insectivorous species may not be present at SWMUs 27, 28 and 29. If field investigations identify significant foraging by aerial insectivores (e.g., swallows) at SWMU 27 above aquatic habitats, please include the exposure pathway for aerial insectivores (e.g., swallows, bats).

**Navy Response to PREQB Page-Specific Comment 21 (June 23, 2011):** The text within the first full paragraph on Page 5-14 of the draft work plan (i.e., paragraph beneath the two bullet items addressing terrestrial ground mammals) will be revised to remove any reference to sediment. As discussed in Section 5.1.2, aquatic habitats contiguous to SWMUs 27 and 28 consist of estuarine wetlands (E2SS3

wetland immediately east of SWMU 27 and E2F03 wetland immediately east of SWMU 28). The Caribbean Sea also borders SWMU 27 to the south. There are no aquatic habitats within or immediately contiguous to SWMU 29. Despite being well established in freshwater environments, aquatic insects are poorly represented in marine systems. Based on the lack of freshwater aquatic habitats at and contiguous to each SWMU, the Navy does not believe that the sediment-aquatic insect larvae-flying adult insect-aerial insectivore exposure pathway warrants consideration as a potentially complete exposure pathway. The information presented above will be incorporated into Section 5.3.3 as a new paragraph on Page 5-14. This new paragraph is shown below.

Aerial insectivores also are not expected to have any appreciable exposure to chemicals in sediment at SWMUs 27, 28, and 29. As discussed in Section 5.1.2, aquatic habitats contiguous to SWMUs 27 and 28 consist of estuarine wetlands (E2SS3 wetland immediately east of SWMU 27 and E2F03 wetland immediately east of SWMU 28). The Caribbean Sea also borders SWMU 27 to the south. There are no freshwater aquatic habitats within or contiguous to SWMUs 27 or 28, nor are there freshwater habitats within or contiguous to SWMU 29. Despite being well established in freshwater environments, aquatic insects are poorly represented in marine systems. Based on the lack of freshwater aquatic habitats at and contiguous SWMUs 27, 28, and 29, it can be concluded that suitable aquatic habitat is lacking for the establishment of a freshwater aquatic community that includes aquatic insects. Therefore, the sediment-aquatic insect larvae-adult insect-aerial insectivore exposure pathway does not warrant consideration as a complete exposure pathway at each SWMU.

Although suitable aquatic habitat is lacking at each SWMU (i.e., freshwater habitats), it is noted that the estuarine habitats contiguous to SWMUs 27 and 28 do not represent favorable foraging areas for swallows. Swallows, including those species reported at NAPR (barn swallow, cave swallow, and purple martin; see Table 5-1 of the draft work plan) prefer open foraging areas above fields and open water. As evidenced by Figures 5-4 and 5-5 of the draft work plan, preferred foraging areas are absent from the E2SS3 wetland adjacent to SWMU 27 and the E2F03 wetland adjacent to SWMU 28.

***PREQB Page-Specific Comment 22 (April 19, 2011): Page 6-1, Section 6.0:***

*a. Please include the most current version of the ProUCL User's Guide as a primary reference. This guidance and software needs to be used in calculating 95% upper confidence limit of the mean (95%UCL) exposure point concentrations rather than the EPA's 2002 guidance, "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites."*

**Navy Response to PREQB Page-Specific Comment 22a (June 23, 2011):** The primary reference list will be updated to include the ProUCL User's Guide. However, EPA's 2002 guidance will not be removed as it remains applicable for risk assessments when making recommendations for calculating 95% UCLs and applying these methods at hazardous waste sites. Note that this guidance recommends ProUCL as a tool that may be used in calculating 95% UCLs. However, it is also stated that "the ultimate responsibility for deciding how best to represent the concentration data for a site lies with the project team." and as such it is possible that alternative methods presented in the 2002 guidance document may be considered and selected. Additionally, this document is considered one of the primary references related to the planning and scoping of a risk assessment.

**PREQB Evaluation of Response (August 12, 2011):** *PREQB requests the use of ProUCL in calculating 95% UCLs, as the guidance and software contain updated methods and EPA guidance for the calculation of UCLs not addressed in the 2002 guidance. The use of this software is consistent with how the Navy calculates EPCs at other DoD sites in Puerto Rico.*

**Navy Response to Evaluation of Response (October 13, 2011):** As indicated in our previous response, the primary reference list has been revised to include the most current version of the ProUCL User Guide.

However, the most recent version of ProUCL software available at the time the human health risk assessment is completed will be used in the calculation of EPCs.

*b. Please use the 2009 update to the Exposure Factors Handbook, rather than the 1997 version.*

**Navy Response to PREQB Page-Specific Comment 22b (June 23, 2011):** The Navy respectfully disagrees with this comment. The 2009 update to the Exposure Factors Handbook has not been revised in accordance with comments that may have resulted from the external review/public comment period. Therefore, the Final Exposure Factors Handbook (1997 version) will be cited in this CMS Work Plan. However, should the 2009 update be revised/finalized prior to the implementation of the CMS investigation, the 2009 version will be consulted and referenced in the risk assessment.

*c. Please include EPA's "Role of Background in the CERCLA Cleanup Program, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Office of Emergency and Remedial Response, OSWER 9285.6-07P, April 26, 2002" as a primary reference as the procedures for handling background concentration data need to be consistent with this guidance.*

**Navy Response to PREQB Page-Specific Comment 22c (June 23, 2011):** The primary reference list will be updated to include the "Role of Background in the CERCLA Cleanup Program, OSWER, Office of Emergency and Remedial Response, OSWER 9285.6-07P, April 26, 2002." Additionally, the Navy's "Navy Policy on the Use of Background Chemical Levels, Memorandum from Chief of Naval Operations (CNO) to Commander, Naval Facilities Engineering Command, Ser N45C/N4U7322212" will be added to the primary reference list.

*d. Please clarify what data or values are being obtained from the EPA 1991 guidance "Standard Default Exposure Factors." Several primary references contain updated data; therefore, it is unclear that this guidance should be used as a primary reference.*

**Navy Response to PREQB Page-Specific Comment 22d (June 23, 2011):** The proposed exposure parameters and corresponding references are listed in Table 6-2. Specifically, the soil ingestion rates for adult and youth trespassers and adult and young child residents, groundwater ingestion rate for adult residents, and the soil exposure durations for adult trespassers and adult and young child residents were taken from "Standard Default Exposure Factors" (USEPA, 1991).

**PREQB Page-Specific Comment 23 (April 19, 2011):** Page 5-26, Section 5.5.2.2.1: The text states that fish tissue concentrations were estimated by multiplying maximum sediment concentrations by soil-to-invertebrate BAFs. Please revise this to sediment-to-fish BAFs. The selection of BSAFs for inorganics to fish is of concern. Chromium, copper and lead BSAFs to fish were obtained from Krantzberg and Boyd (1992) where freshwater sediments from a highly-contaminated harbor in freshwater Lake Ontario were evaluated. The bioavailability of metals in marine/estuarine sediments at the Naval Activity Puerto Rico (NAPR) are likely to be significantly different than in Lake Ontario. As noted by Krantzberg and Boyd (1992), although sediment metal concentrations were high in their study, complexation of these metals with iron or sulfur compounds may limit the bioavailability of these metals. Their study area had extremely high iron concentrations present in the sediment due to metal smelting and likely affected metal bioavailability via coprecipitation of metals with iron hydroxide. Similarly, arsenic, cadmium and zinc fish BSAFs were from a study evaluating metals contamination at a mine in Montana (Pascoe et al., 1996). Given that conditions at NAPR are significantly different, it is recommended that for arsenic, cadmium, chromium, copper, lead, and zinc, a fish BSAF value of 1 be selected as this would provide a more conservative and protective value that is appropriate for a screening level ecological risk assessment.

**Navy Response to PREQB Page-Specific Comment 23 (June 23, 2011):** The text in Section 5.5.2.2.1 describing the methodology used to derive exposure point concentrations in fish tissue will be revised by replacing “soil-to-invertebrate BAFs” with “sediment-to-fish BAFs”. With regard to the sediment-to-fish BAF values for arsenic, cadmium, chromium, copper, lead, and zinc, Table 5-10 will be revised to show that an assumed BAF of 1.0 will be used in the Step 2 screening level risk calculation. However, the sediment-to-fish BAF values listed in Table 5-19 of the draft work plan for these six metals will still be used in Step 3a of the baseline ERA, unless more appropriate values are identified from the literature.

**PREQB Evaluation of Response (August 12, 2011):** The response partially addresses the comment. PREQB agrees that using a default sediment-to-fish BAF of 1.0 in Step 2 of the SLERA will provide an appropriate and conservative evaluation of risks to piscivorous receptors. The response further indicates that Step 3A of the SLERA will include the BAFs of arsenic, cadmium, chromium, copper, lead and zinc obtained from the literature. It is unclear whether additional literature will be reviewed or if the values presented in Krantzberg and Boyd (1992) and (Pascoe et al., 1996) will be used. If the BAFs from these two sources are used, then Step 3A of the SLERA should also discuss the uncertainties associated with using these BAFs as previously noted by PREQB.

**Navy Response to PREQB Evaluation (October 13, 2011):** To address PREQB’s concern regarding the BAFs from Krantzberg and Boyd (1992) and Pascoe et al. (1996), a search will be conducted to determine if alternate values are available from the literature. If alternative values are not identified from the literature, the ERA will include a discussion of the uncertainties associated with using the Krantzberg and Boyd (1992) and Pascoe et al. (1996) values in the refined risk calculation. The discussion will include the issues identified by the PREQB within Page-Specific Comment No. 23 above. Risk estimates for avian piscivore dietary exposures will also be derived using assumed BAFs of 1.0 to determine the impact the Krantzberg and Boyd (1992) and Pascoe et al. (1996) values have on estimated dietary intakes.

**PREQB Page-Specific Comment 24 (April 19, 2011):** *Pages 6-1 and 6-1, Sections 6.0 and 6.2: For consistency with "Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part A)", a primary reference, the first step in a human health risk assessment (HHRA) is Data Evaluation. Consistent with the primary reference, this step needs to present the evaluation of analytical methods, quantitation limits and their effect on meeting data quality objectives, and screening (refer to Section 5 of the primary reference). The result of the Data Evaluation is the identification of chemicals of potential concern (COPCs) that will be evaluated further in the HHRA. Please present this data evaluation in this report, since this report needs to demonstrate that compiling data from various investigations meets DQOs for this I-H-IRA. Please revise the section title and proposed discussion to be consistent with RAGS Part A guidance for Data Evaluation.*

**Navy Response to PREQB Page-Specific Comment 24 (June 23, 2011):** The Navy respectfully disagrees with this comment. This general format has been used in other HHRAs conducted for NAPR without comment up to this point (e.g., Revised Draft RCRA Facility Investigation Report for SWMU 9 [Baker, 2000], Final RCRA Facility Investigation Report for SWMU 14 [Baker, 2007], Revised Draft Corrective Measures Study Report for SWMU 56 [Baker, 2010]). The outcome of the overall data evaluation is the identification of a set of data for use in the HHRA, which is reflected in the title of Section 6.2, and both key components of the first step of the HHRA (i.e., data evaluation and COPC selection) are presented within this section. Revision of the format of the section headings will not affect the outcome of the data evaluation/COPC selection. Note that the actual data evaluation will be presented in the HHRA as additional data (to be combined with existing data from the USEPA-approved Final RFI documents) remain to be collected as part of the CMS investigation for SWMU 28.

## References

Baker, 2000. Revised Draft RCRA Facility Investigation Report for SWMU 9, Naval Station Roosevelt Roads, Puerto Rico. March 10, 2000.

Baker, 2007. Final RCRA Facility Investigation Report for SWMU 14. March 23, 2007.

Baker, 2010. Revised Draft Corrective Measures Study Report for SWMU 56. October 29, 2010.

**PREQB Evaluation of Response August 12, 2011):** As requested in the original comment, please present the evaluation of analytical methods, quantitation limits and their effect on meeting data quality objectives in Section 6.2.1 once all investigation data have been compiled.

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** An evaluation of analytical methods, quantitation limits, and their effect of meeting data quality objectives will be presented in Section 6.2.1 of the human health risk assessment.

**PREQB Page-Specific Comment 25 (April 19, 2011):** *Page 6-3, Section 6.2.1: PREQB's preference is for groundwater data from wells located in the center of a plume to be used to establish the EPC for each COPC for groundwater. The use of data from all wells, including those wells beyond the extent of a groundwater plume will underestimate EPCs through dilution. This is consistent with available EPA guidance for calculating EPCs for groundwater, "Exposure Point Concentrations in Groundwater, US Environmental Protection Agency Region III, Office of Superfund, Hazardous Waste Management, EPA/903/8-91/002, November 1991." Refer to Section "Well Placement, A. Horizontal Well Placement" for the discussion of well placement for risk purposes. Please note that the use of data from throughout a plume is acceptable if no apparent source area is identified.*

**Navy Response to PREQB Page-Specific Comment 25 (June 23, 2011):** The following sentence will be added to the fourth paragraph of Section 6.2.1:

Additionally, for the evaluation of groundwater exposure, only groundwater data from wells located in the center of an established plume will be used to determine the EPC. In the event that no apparent source area is identified, all groundwater data will be used for the EPC determination.

**PREQB Evaluation of Response (August 12, 2011):** *Please revise the proposed text to state "...In the event that no apparent source area is identified, all groundwater data from within the plume boundary will be used for the EPC determination.;*

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** The proposed text for inclusion in Section 6.2.1 will be revised as requested in the comment.

**PREQB Page-Specific Comment 26 (April 19, 2011):** *Page 6-3, Section 6.2.3: Please clarify why the second paragraph includes a discussion of background screening and the type of background values that will be used when the prior section states that background screening will not be used to eliminated chemicals during COPC Selection. A discussion of the contribution of background to site risks is more appropriately presented in the Risk Characterization Section.*

**Navy Response to PREQB Page-Specific Comment 26 (June 23, 2011):** As discussed in Section 5 of RAGS Part A (USEPA, 1989), comparison of samples with background is part of the data evaluation process. It is further stated that it is the RPM's decision as to whether or not to quantitatively assess the risks posed by naturally occurring background chemicals. Therefore, in accordance with USEPA's preference (also consistent with *Navy's Policy on the Use of Background Chemical Levels*), chemicals are not eliminated from quantitative evaluation based on comparison to background screening levels. Rather, risks from all COPCs are quantified and final site recommendations are based on results of the HHRA and comparisons with the background levels as appropriate for the inorganic analytes. Contribution of background to site risks will be discussed in the HHRA along with the risk characterization and as an uncertainty.

**PREQB Evaluation of Response (August 12, 2011):** Please refer to current EPA guidance, *Role of Background in the CERCLA Cleanup Program*, OSWER, Office of Emergency and Remedial Response, OSWER 9285.6-07P, April 26, 2002 for EPA's current policy on the role of background in HHRAs. As discussed in this policy, chemicals are not eliminated based on a comparison to background. The text of Section 6.2.3, COPC Selection Criteria, specifically states "As previously mentioned, inorganic constituents were also compared to corresponding background screening concentrations. The background data to be used for comparison purposes in this HHRA are taken from the Revised Final II Summary Report for Environmental Background Concentrations of Inorganic Compounds (Baker, 2010), for NAPR. The criterion used for screening is the ULM, which is calculated as the mean plus two times the standard deviation of the mean." This text conflicts with the COPC selection process and EPA and Navy guidance. Therefore, for clarity and consistency with current EPA and Navy policy, please remove this discussion of background from this section.

**Navy Response to PREQB Evaluation (October 13, 2011):** The discussion of background will be removed from Section 6.2.3.

**PREQB Page-Specific Comment 27 (April 19, 2011):** *Page 6-4, Section 6.2.3: PREQB's preference is for all tables to be presented in RAGS Part D format. Please clarify that the tables will comply with RAGS Part D, a primary reference for this HHRA.*

**Navy Response to PREQB Page-Specific Comment 27 (June 23, 2011):** The last paragraph of Section 6.2.3 – COPC Selection Criteria will be revised as follows:

Tables (in the RAGS Part D format) will be provided which summarize the data for the media identified at SWMU 28 (soil, groundwater, surface water [if encountered] and sediment [if encountered]) and the COPC selection process.

**PREQB Page-Specific Comment 28 (April 19, 2011):** *Page 8-1, Section 8.0: As the investigations to date have focused on evaluating releases from the sludge drying pits to the surrounding environment and an investigation of whether the sludge or soils beneath the sludge have been contaminated has not been done because they are still being used, a land use restriction to ensure that the sludge pits are not used for any other purpose needs to be a part of each proposed remedy.*

**Navy Response to PREQB Page-Specific Comment 28 (June 23, 2011):** There will be a land use control on the sludge beds that will serve as a cap. The sludge beds will eventually be transferred to the PRASA (Sewage Authority).

**PREQB Page-Specific Comment 29 (April 19, 2011):** *Table 3-3: Please change the sampling interval for proposed sample 28SS14 from 0-1.1 feet to 0-1.0 feet.*

**Navy Response to PREQB Page-Specific Comment 29 (June 23, 2011):** The sampling interval for proposed sample 28SS14 has been changed from 0-1.1 feet to 0-1.0 feet on Table 3-3.

**PREQB Page-Specific Comment 30 (April 19, 2011):** *Table 5-5: The hierarchy presented on page 5-18 for evaluating marine/estuarine surface water and ground water constituents indicates that acute NOECs or NOELs have precedence over LOECs/LOELs or LC50 values for selecting a screening value. Please ensure this approach was consistently applied throughout this table. For example, the beryllium screening value presented in Table 5-5 was based on adjusting an LC50 value obtained in the ECOTOX database by a safety factor of 100. However, an acute NOEC of 5,000 ug/L was reported for the mummichog test organism in the ECOTOX database. Applying a safety factor of 30 to this acute NOEC would result in a screening value of 167 ug/L for beryllium rather than the 310 listed in Table 5-5. Please*

*correct and review/verify all ECOTOX values to ensure consistency with the screening value selection hierarchy.*

**Navy Response to PREQB Page-Specific Comment 30 (June 23, 2011):** When the ECOTOXicology (ECOTOX) database was used as the source of toxicity test data for groundwater and surface water screening value development, the acute values selected for consideration were identified based on endpoint codes contained within the database. The specific endpoint codes used to select acute values for screening value development (using the selection hierarchy identified in Section 5.4.1.2 of the draft work plan) were those identified as NOEC, LOEC, EC<sub>50</sub>, and LC<sub>50</sub> values. The endpoint code listed in the ECOTOX database for the beryllium value referenced in PREQB Page-Specific Comment No. 30 above (5,000 µg/L) is “NR-ZERO.” A review of the ECOTOX database code list indicates that “NR-ZERO” is defined as 0 percent mortality or 100 percent survival of organisms. Based on this definition, toxicity values based on a “NR-ZERO” endpoint are equivalent to NOEL/NOEC values and, therefore, should have been considered during screening value development. Given that the beryllium “NR-ZERO” toxicity value of 5,000 µg/L is less than the 96-hour mummichog LC<sub>50</sub> value that was used as the basis for the marine/estuarine screening value listed in Table 5-5, the screening should be based on the “NR-ZERO” value, not the 96-hour LC<sub>50</sub> value. For this reason, Table 5-5 of the draft report will be revised to show a screening value of 167 µg/L for beryllium (96-hour mummichog “NR-ZERO” value with a safety factor of 30).

To determine if “NR-ZERO” endpoints were overlooked for other chemicals with screening values developed from acute toxicity values listed in the ECOTOX database, ECOTOX toxicity values for these chemicals were reviewed to verify all appropriate toxicity data were considered during screening value development. The review identified one additional chemical (hexachlorobenzene) with a “NR-ZERO” endpoint value (96-hour value of 2.3 µg/L for the northern pink shrimp) that should have been used during screening value development. The “NR-ZERO” value is less than the acute toxicity value used as the basis of the screening value listed in Table 5-5 of the draft work plan (48-hour EC<sub>50</sub> value of >1,000 µg/L for the Virginia oyster). Selection of the “NR-ZERO” value yields a marine/estuarine screening value of 0.077 µg/L (“NR-ZERO” value of 2.3 µg/L with a safety factor of 30). As such, Table 5-5 will be revised to show a screening value of 0.077 µg/L for hexachlorobenzene. It is noted that during the data review process, an acute value was identified from the ECOTOX database for pentachloronitrobenzene, which is more conservative than the value used to derive the screening value listed in Table 5-5. As evidenced by Table 5-5 of the draft work plan, the screening value listed for pentachloronitrobenzene is based on a 96-hour LC<sub>50</sub> of 23 µg/L for the opossum shrimp. However, based on the selection hierarchy identified in Section 5.4.1.2, the screening value should be based on a more conservative LC<sub>50</sub> value (96-hour LC<sub>50</sub> value of 12 µg/L for the opossum shrimp). Therefore, Table 5-5 will be revised to show a marine/estuarine screening value of 0.12 µg/L for this organic chemical (LC<sub>50</sub> value of 12 µg/L with a safety factor of 100). Beyond the screening value revisions for beryllium, hexachlorobenzene, and pentachloronitrobenzene, the review of the ECOTOX database did not identify toxicity values for other chemicals that warranted revisions to existing screening values.

**PREQB Page-Specific Comment 31 (April 19, 2011):** *Table 6-2 and Figure 6-1: Please add ingestion of groundwater at a rate of 1 liter/day as potentially complete exposure pathway for the commercial/industrial worker.*

**Navy Response to PREQB Page-Specific Comment 31 (June 23, 2011):** The Navy respectfully disagrees with this comment. Evaluation for groundwater exposure via ingestion will not be included for the future industrial/commercial worker for the following reasons. Groundwater exposure is not listed as a potentially complete pathway for a future industrial worker in the RCRA §7003 Administrative Order on Consent for NAPR (USEPA, 2007). It is unlikely that a future worker (assuming an indoor office setting) would consume a significant amount of tap water while working at a site when compared to the amount of tap water consumed at a residence. The HHRA currently includes an evaluation of the groundwater ingestion exposure pathway for future residential and future construction worker receptors.

Therefore, the potential groundwater exposure is adequately evaluated using the future residential and construction worker receptors. No revisions to Table 6-2 or Figure -1 are proposed.

**PREQB Evaluation of Response (August 12, 2011):** *PREQB disagrees with the Navy's interpretation of the Administrative Order on Consent. As stated by EPA (2011), "Under EPA guidance the Navy needs to clean-up to the expected future land usage, not past usage. The 2007 RCRA Consent Order does not specify the future land usage..." As all groundwater is considered a potential drinking water source based on current Puerto Rico regulation; EPA considers ingestion of groundwater by commercial/industrial workers a reasonable exposure pathway and provides specific guidance on assuming a commercial/industrial worker ingests 1 liter per day (refer to Section 3.1 of the 1991 Standard Default Exposure Factors reference); and the Navy routinely evaluates groundwater ingestion by commercial/industrial workers at other DoD sites in Puerto Rico; please quantify risks for commercial/industrial worker exposure to drinking water at the EPA recommended ingestion rate of 1 l/day.*

**Navy Response to Evaluation of Response (October 13, 2011):** Table 6-2 and Figure 6-1 will be revised to include quantification of risks for commercial/industrial worker exposure to drinking water assuming an ingestion rate of 1 L/day.

**PREQB Page-Specific Comment 32 (April 19, 2011):** *Table 3-2: The QLs listed for metals in aqueous samples appear very high and more appropriate for analysis via 6010C instead of 6020A. Please verify these QLs with the laboratory and/or procure a laboratory that is capable of reporting lower QLs. Most of the listed QLs appear to be high by about one order of magnitude compared to QLs typically reported by method 6020A. It is important to note that many of the aqueous metals QLs exceed the risk screening levels (ecological groundwater screening levels presented in Table 5-5 as well as the May 2010 EPA RSLs) and therefore lower QLs are really needed in order to achieve project objectives. Specific exceedances of risk screening levels are as follows:*

- Antimony QL (20) > EPA Tap water RSL (1.5)
- Arsenic QL (10) > EPA Tap water RSL (0.045)
- Cadmium QL (5) > EPA Tap Water RSL (1.8)
- Chromium QL (10) > EPA Tap Water RSL (0.043)
- Cobalt QL (10) > EPA Tap Water RSL (1.1)
- Vanadium QL (10) > EPA Tap Water RSL (0.26)
- Copper QL (20) > ecological groundwater screening levels (3.73)
- Nickel QL (40) > ecological groundwater screening levels (8.28)
- Silver QL (10) > ecological groundwater screening levels (0.23)

*It is PREQB's preference for the quantitation limits to meet the data quality objectives. It appears that the same QLs in Table 3-2 were used during the Phase I RFI and the full RFI. Please note that for all metals, the QLs provided by the Navy for the 6020 analysis of aqueous samples are much higher than QLs typically observed by PREQB for this method. The table below compares typical QLs to those provided by the Navy as well as the standard EPA CLP methodology for ICP/MS. Please provide additional information as to why your lab cannot achieve typical QLs for this method.*

<b>Quantitation Limits for SW-846 Method 6020A (ICP/MS)</b>						
<b>Metals by ICP/MS</b>		<b>SWMU 78 Proposed QLs</b>	<b>Lab 1 QLs</b>	<b>Lab 2 QLs</b>	<b>Lab 3 QLs</b>	<b>EPA CLP Method QLs</b>
(ug/L)	Antimony	20	0.05	1.0	0.5	2
6020A	Arsenic	10	0.5	0.40	0.5	1

<i>Barium</i>	<i>10</i>	<i>0.05</i>	<i>50</i>	<i>0.5</i>	<i>10</i>
<i>Beryllium</i>	<i>4.0</i>	<i>0.03</i>	<i>0.40</i>	<i>0.5</i>	<i>1</i>
<i>Cadmium</i>	<i>5.0</i>	<i>0.03</i>	<i>0.50</i>	<i>0.5</i>	<i>1</i>
<i>Chromium</i>	<i>10</i>	<i>0.2</i>	<i>10</i>	<i>0.5</i>	<i>2</i>
<i>Cobalt</i>	<i>10</i>	<i>0.03</i>	<i>NA</i>	<i>0.5</i>	<i>1</i>
<i>Copper</i>	<i>20</i>	<i>0.1</i>	<i>NA</i>	<i>0.5</i>	<i>2</i>
<i>Lead</i>	<i>5.0</i>	<i>0.03</i>	<i>1.0</i>	<i>0.5</i>	<i>1</i>
<i>Nickel</i>	<i>40</i>	<i>0.2</i>	<i>5.0</i>	<i>0.5</i>	<i>1</i>
<i>Selenium</i>	<i>10</i>	<i>1.5</i>	<i>5.0</i>	<i>1</i>	<i>5</i>
<i>Silver</i>	<i>10</i>	<i>0.03</i>	<i>0.50</i>	<i>0.5</i>	<i>1</i>
<i>Thallium</i>	<i>10</i>	<i>0.03</i>	<i>0.20</i>	<i>0.5</i>	<i>1</i>
<i>Tin</i>	<i>10</i>	<i>0.1</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<i>Vanadium</i>	<i>10</i>	<i>0.3</i>	<i>5.0</i>	<i>0.5</i>	<i>5</i>
<i>Zinc</i>	<i>20</i>	<i>0.75</i>	<i>20</i>	<i>5</i>	<i>2</i>

(1) *Columbia Analytical Services, Kelso, Washington (DoD Certified)*

(2) *Con-test Analytical in East Longmeadow, MA*

(3) *Alpha Analytical in Westborough, MA*

**Navy Response to PREQB Comment 32 (June 23, 2011):** The information provided in Table 3-2 has been reviewed against project-specific screening levels and has been determined to generally meet these levels. The quantitation limits have also been reviewed by an analytical laboratory to ensure that they can be met. In all cases, the quantitation limits are the lowest achievable by the laboratory for the specified analytical method. The project-specific screening values are then provided to the analytical laboratory subcontractor as part of their scope of work so that the laboratory is clearly aware of the analytical requirements of the project. Upon the selection of the subcontracted analytical laboratory for this investigation, laboratory specific SOPs and QC limits will be reviewed to confirm they will be able to meet the applicable screening levels. Additionally, upon further review of Table 3-2, it was discovered that outdated QLs were included in error for SW-846 Method 6020A (ICP/MS) analysis of groundwater. Therefore, Table 3-2 will be revised to include the most current QLs available for Method 6020A.

**PREQB Evaluation of Response (August 12, 2011):** *Agency review of the selected laboratory's achievable limits is requested as part of the work plan review. PREQB prefers that a table be prepared in all work plans summarizing the information included on Worksheet #15 of the UFP-QAPP that EPA has requested the Navy prepare on all future projects to ensure that the data will meet the project action limits and that the data collected during the investigation meets data quality objectives for making site cleanup decisions. However, PREQB will defer to EPA on this issue. In addition, agency review of the laboratory's achievable limits as part of the SAP review is routinely conducted at other DoD sites in Puerto Rico.*

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** The Navy recognizes that the Unified Federal Policy Sampling and Analysis Plan (UFP SAP) is currently the preferred work plan format. Based on discussions between the Navy, EPA, PREQB and Baker during a conference call held on May 3, 2011, the Navy has agreed to phase in the UFP SAP work plan requirements for new Baker projects at NAPR; existing projects will be completed following the format and requirements of the existing approved Master Project Plans for NAPR. The Navy's May 19, 2011 letter to the EPA documents this approach for implementing the UFP SAP requirements and specifically indicates that new work plans for SWMU 27, 28 and 29 Corrective Measures Implementation and SWMU 60 and 79 Full RFIs will be prepared in the UFP SAP format.

Based on the above agreement, the CMS Investigation Work Plan for SWMUs 27, 28 and 29 that is currently under development will remain in the "old" format. As indicated in our previous response, to help ensure that screening levels are met, required quantitation limits are provided to the laboratory as part of their contractual scope of work. Upon the selection of the subcontracted analytical laboratory for

this investigation, laboratory specific SOPs and QC limits will be reviewed to confirm they will be able to meet the applicable screening levels. The analytical laboratory's specific SOPs, QC limits, and QLs will be included as an addendum to the draft CMS Investigation Report.

**PREQB Page-Specific Comment 33 (April 19, 2011):** *Figure 3-1: Please add a sample point location between 278B01 and proposed location 27SB18 to provide better coverage of the area around 27SS02 and 27SS05, consistent with the proposed sampling density.*

**Navy Response to PREQB Page-Specific Comment 33 (June 23, 2011):** Sample point 27SB22 has been added between 27SB01 and 27SB18, as recommended by this comment. Revisions have been incorporated into Table 3-1, Figure 3-1 and the second bullet of Section 3.1.2.1, as follows:

- Ten surface soil samples are proposed at borings 27SB09 through 27SB11, 27SB15 through 27SB20, and 27SB22. These borings are located around sampling points northeast of the sludge drying beds, where mercury and zinc have been detected in surface soils above ecological screening criteria and background.

**PREQB Page-Specific Comment 34 (April 19, 2011):** *Figure 3-2 / Section 3.2: Please add proposed sampling locations to the north of 28SS05 in order to better delineate this area of contamination.*

**Navy Response to PREQB Page-Specific Comment 34 (June 23, 2011):** Please refer to the Navy's response to EPA Specific Comment 2.

**PREQB Page-Specific Comment 35 (April 19, 2011):** *Figure 3-3: Please clarify why the area around 298B14 (an area of exceedances) is not slated for further delineation.*

**Navy Response to PREQB Page-Specific Comment 35 (June 23, 2011):** Please see the Navy's Response to EPA Specific Comment 3.

**PREQB Page-Specific Comment 36 (April 19, 2011):** *Appendices A, B and C: Please include the screening criteria used for all chemicals presented in the figures in these appendices, as these figures present historical information that forms the basis for the current investigation.*

**Navy Response to PREQB Page-Specific Comment 36 (June 23, 2011):** The screening criteria used for the Phase I and the Full RFIs for SWMUs 27, 28 and 29 are discussed in detail in Section 5.1 of the reports. The screening levels are also shown on the Section 5.0 hits tables in each report mentioned above. The reader is referred to these historical documents for additional detail. No edits are proposed.

References:

Michael Baker Jr. Inc. (Baker), 2008a. Final Full RCRA Facility Investigation SWMU 27 – Capehart Wastewater Treatment Plant Sludge Drying Beds Naval Activity Puerto Rico, EPA ID No. PR2170027203, Ceiba, Puerto Rico. August 28, 2008.

Baker, 2008b. Final Full RCRA Facility Investigation SWMU 28 – Bundy Wastewater Treatment Plant Sludge Drying Beds Naval Activity Puerto Rico, EPA ID No. PR2170027203, Ceiba, Puerto Rico. August 28, 2008.

Baker, 2008c. Final Full RCRA Facility Investigation SWMU 29 – Industrial Area Wastewater Treatment Plant Sludge Drying Beds Naval Activity Puerto Rico, EPA ID No. PR2170027203, Ceiba, Puerto Rico. August 28, 2008.

**PREQB Evaluation of Response (August 12, 2011):** *This CMS work plan scopes an investigation for further delineation of chemicals exceeding screening criteria. The response refers PREQB to reports published in 2008. Please include a discussion in the work plan as to whether human health or ecological screening criteria have been updated since the completion of the RFIs and discuss the impact of any such updated criteria on the adequate delineation of contamination at these sites. This CMS work plan needs to demonstrate that it will adequately address site data gaps based on current screening criteria.*

**Navy Response to PREQB Evaluation of Response (October 13, 2011):** The objectives of the CMS Investigations for SWMU 27, 28 and 29 are based on the data gaps identified and the recommendations given in the EPA approved Final Full RFI Report for each respective SWMU. The screening criteria used are those which are in the EPA approved Final documents. Data were not rescreened for preparation of this CMS Investigation Work Plan. However, updated human health and ecological screening criteria that will be used for preparation of the CMS Investigation Report are included in the CMS Investigation Work Plan. As part of the CMS Investigation Report, Phase I and Full RFI data will be combined with CMS Investigation data, as appropriate, and screened according to the criteria in the CMS Investigation Work Plan. The combined data set also will undergo human health and/or ecological risk assessment.