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June 13, 2011

U.S. Army Engineer District, Nashville
ATTN: CELRN-EC-E (Ms. Kathy McClanahan)
110 Ninth Avenue South, Room 682
U.S. Court House Annex
Nashville, Tennessee 37203

Submittal of the Response to Comments for the Final Site-Specific Sampling and Analysis Plan Remedial Investigation for Data Gap Investigation for the Garage Maintenance Area-Former Sellite Area and Unloading Area
Former Plum Brook Ordnance Works, Sandusky, Ohio
Contract No. W91278-10-D-0094: Shaw Project No. 141427

Dear Ms. McClanahan:

In accordance with the requirements of Delivery Order No. DX01 of Contract No. W91278-10-D-0094, Shaw is pleased to submit the Response to Comments for the Final Site-Specific Sampling and Analysis Plan Remedial Investigation for the Data Gap Investigation for the Garage Maintenance Area- Former Sellite Area and Unloading Area at the Former Plum Brook Ordnance Works (PBOW) located in Sandusky, Ohio.

Enclosed are three copies of the Response to Comments. Copies have also been sent to those on the distribution list, as indicated, for their records. As requested, the document was sent to the Center of Expertise in electronic format only.

Should you have any questions or require additional information regarding this submittal, please do not hesitate to contact me at (865) 694-7496.

Sincerely,

for Steve Downey

Steven T. Downey, PE, PMP
Project Manager

Enclosures

Control Copy Distribution List

Name	Control Copy
U.S. Army Engineer District, Nashville ATTN: CELRN-EC-E (Ms. Kathy McClanahan) 110 Ninth Avenue South, Room 682 Annex Nashville, TN 37203	1-3
U.S. Army Engineer District, Huntington ATTN: CELRH-PM-PP-P (Mr. Rick Meadows) 502 Eighth Street Huntington, West Virginia 25701-2070	4-6
U.S. Army Corps of Engineers HTRW Center of Expertise ATTN: CEHNC-CX-EG (Vern StJohn) 1616 Capitol Avenue Omaha, Nebraska 68144-3869	(CD only)

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RESPONSE TO COMMENTS
DRAFT WORK PLAN REMEDIAL INVESTIGATION
DATA GAP INVESTIGATION FOR THE GARAGE MAINTENANCE AREA-
FORMER SELLITE AREA AND UNLOADING AREA
FORMER PLUM BROOK ORDNANCE WORKS, SANDUSKY, OHIO
(Report dated March 2011)

Reference: Comments from Jim Beaujon, USACE-Nashville District, received March 29, 2011.

Comment 1: **Binder and Document titles: With both the SSAP and the SSHP in the same binder if you aren't going to list them both on the binder title sheets then the binder should be titled "Work Plans", plural. Then each document within the binder should be appropriately titled "Site-Specific Sampling and Analysis Plan" or "Site-Specific Health and Safety Plan". (But you should also mention the SSAP is an addendum to the SWSAP so maybe it should be "Site-Specific Sampling and Analysis Plan Addendum"?)**

Response 1: The SSAP and SSHP will be sent out as separate reports. The binder cover will state whether it is a SSAP or SSHP. This will avoid having "Work Plans" on some reports that contain both the SSAP and SSHP(Shaw, Nashville, and NASA) and "Work Plan" on the rest of the reports.

Comment 2: **Page 1-1, 1st pph, 7th line: Change "owned by" to "controlled and maintained by".**

Response 2: Agreed. "Owned by" will be changed to "controlled and maintained by".

Comment 3: **Page 1-2, figure numbering: Figures are generally ordered and numbered by their first reference in the text. Figures 1-3 and 1-4 are out of order as their reference comes after references to Figures 1-5, 1-6, and 1-7. Coordinate text and appropriate figure numbers and sequence.**

Response 3: Agreed. Figure numbers will be changed to be in sequential order following the text.

Comment 4: **Page 1-2, Section 1.2.1.1 and Section 1.2.1.2: Section 1.2.1.2 refers to the Unloading Area as the "Rail Car Unloading Area". Assuming you want to stick with "Unloading Area" as the AOC name for the rest of the document, consider changing the appropriate in Section 1.2.1.2 to read something like "including the Unloading Area (referred to as the Rail Car Unloading Area by MK, 1994)."**

Response 4: Agreed. The text will be changed as suggested.

Comment 5: **Page 1-3, 1st pph: Add after the first sentence another sentence listing what the soil samples were analyzed for and what those results were evaluated/screened against, including what year the criteria were issued,**

e.g. EPA 1990 RSLs. Also, for the current second sentence change "Four compounds exceeded" to "Four compounds, all polycyclic aromatic hydrocarbons (PAH), exceeded". Then just use "PAH" in the final sentence of the pph.

Response 5: Agreed. Another sentence will be added listing what the soil samples were analyzed for and what those results were evaluated/screened against. The text will be revised as requested.

Comment 6: **Page 1-3, 2nd pph: Add after the first sentence another sentence listing what the soil samples were analyzed for and what those results were evaluated/screened against, including what year the criteria were issued, e.g. EPA 1990 RSLs. Also, change "360 micrograms per liter" to "360 µg/L".**

Response 6: Agreed. Another sentence will be added listing what the soil samples were analyzed for and what those results were evaluated/screened against. The text will be revised as requested.

Comment 7: **Page 1-3, orphaned heading at bottom of page: Here and throughout the document do not allow orphaned headings.**

Response 7: Agreed. Orphaned headings will be fixed.

Comment 8: **Page 1-4, Section 1.2.2.1, 2nd pph: Give a year for when Shaw made its observation of sulfur and slag – "and again by Shaw" in ____?**

Response 8: The text will be revised to state the year Shaw made its observation.

Comment 9: **Page 1-4, Section 1.2.2.2: Figure 1-4 indicates all three MK samples came from the same location, are they a primary sample and QA/QC samples?**

Response 9: The Morrison Knudsen Corporation report (1994) is unclear if they are a primary sample and QA/QC samples. The text will be revised to reflect the uncertainty of the sample locations and will also include the following information: "*SS34, SS35, and SS36 were obtained from an area void of vegetation and covered with lumps of sulfur and coke just west of the intersection of Maintenance Road and the rail spur. Broken timbers were found that indicate that a wooden structure of some sort used to exist in this area*" (MK 1994)."

Comment 10: **Page 1-4, Section 1.2.2.2 lead into bullets: Change to "contained compounds, all PAHs, exceeding their RSLs:".**

Response 10: Agreed. The text will be revised as requested.

Comment 11: **Section 1.2.3 heading: Since there are two sumps in the LBM add "Pit" between "and" and "Sump".**

Comment 11: Agreed. The text will be revised as requested.

Comment 12: **Page 1-5, Section 1.2.3.1: Change appropriate to read – "When the pit was operational , the waste effluent from the pit drained into the pit sump and from there to a sump basin on the south side of the building. A sump pump in the sump basin sent the waste to the sanitary sewer system. A pump is still present in the 2.5 foot diameter and 9 foot, 2 inch deep sump basin."**

Response 12: Agreed. The text will be revised as requested.

Comment 13: **Page 1-5, Section 1.2.3.2, 2nd pph, 3rd line: Change "shows these three borings." to "shows these three borings (SB-07, SB-08, and SB-09)."**

Response 13: Agreed. The text will be revised as requested.

Comment 14: **Page 1-5 and 1-6, Section 1.2.3.2, 2nd pph: The information about DP-01, "Sample DP-01 was collected… (13,000 milligrams per kilogram)", should be presented in the paragraph about the 1999 SI since it was an SI sample.**

Response 14: Agreed. The suggested section will be moved to the paragraph about the 1999 SI.

Comment 15: **Page 1-6, 1st pph on page: Delete the sentence – "The maintenance pit sump… just inside the Locomotive Building" since I incorporated this information in the section 1.2.3.1 revision earlier.**

Response 15: Agreed. The suggested deletion will be made.

Comment 16: **Page 1-6, Section 1.3, 1st pph: In the 6th line, change "overburden/shale soil at the time" to "overburden/shale at the time". In the final sentence, change "limestone flows" to "limestone generally flows".**

Response 16: Agreed. The text will be revised as requested.

Comment 17: **Page 2-3, pph 2nd half of page: In the 2nd line, change "this site is" to "the Sellite Area and Unloading Area are". In the 4th line, change "Because this area of the site is" to "Because PBOW is".**

Response 17: Agreed. The text will be revised as requested regarding reference to "this site is". For the latter comment, the text has been revised to "PBOW is open to deer hunting by permit; therefore, hunters may be . . . .".

Comment 18: **Page 2-5: In the 1st complete pph on page, change the 2 occurrences of "must" to "will". In the 4th bullet item, change "contaminant" to "contaminants".**

Response 18: Agreed. The text will be revised as requested.

Comment 19: **Page 2-6, Section 2.2.6: No boundaries are shown on Figures 3-1 or 3-2. Also, given that the first references to these figures are in Section 2, why aren't these Figures 2-1 and 2-2?**

Response 19: Agreed. Figure 1-3 (previously 1-5) will show the boundaries for the Former Sellite Area and Unloading Area and will be referenced in this section.

Comment 20: **Page 2-7, Sampling and Analytical Methods, end of 1st pph: Edit for clarity – "sample collection have been"?**

Response 20: Agreed. The sentence will be edited for clarity.

Comment 21: **Page 3-1, Section 3.1: In the 1st pph change "the hazardous, toxic, and radioactive waste drilling log" to "the HTRW drilling log" since that's the form's title as presented on Figure 4-2 of the SWSAP. In the 2nd pph change appropriate to read something like "chronological order on a variance log for this project similar to that shown as Figure 9-1".**

Response 21: Agreed. The text will be revised as requested.

Comment 22: **Page 3-2, 1st complete pph on page, 1st sentence: Edit for clarity. I believe you are referring to the soils collected for VOC sample analysis.**

Response 22: It is referring to all soils collected for analytical analysis. The paragraph will be edited to clarify that samples collected for VOC analysis will be collected using a terracore. It will also be edited to clarify that soils collected for VOC analysis will not be homogenized.

Comment 23: **Page 3-2, final pph of Direct-Push Soil Sampling and Methodology section: Move this pph to be the second in the section.**

Response 23: Agreed. The last paragraph will be moved to be the second paragraph in the section.

Comment 24: **Page 3-2, Section 3.1.1: Change "along the east side of" to "east of", change "on the north side" to "north of", and change "along the west and south side of" to "west and south of". Also, according to Figure 3-1: only two of the locations east of the Sellite building are in barren areas, what's the rationale for the location of the third east Bldg 315?; there are 4 borings proposed north of Bldg 315 not just 3, and the 3 in barren areas are in**

three separate barren areas not one big barren area; there are only 5 locations proposed west and south of Bldg 315, not 6.

Response 24: The locations of some soil borings/piezometers have been adjusted to center within barren areas and/or provide better spacing between sampling locations to allow a better scope of contamination. The text will be changed to only reference Figure 3-1 for sampling locations.

Comment 25: **Page 3-2, Section 3.1.1, fill material and sampling depths: I don't believe this SSAP, unlike some others, has explained the potential "fill" before it is mentioned briefly and parenthetically relative to sampling depths. Please present a better description of the post 1945 fill/cover potential and how sampling depths will be adjusted.**

Response 25: Agreed. A better description of the post 1945 fill/cover potential has been added to Section 3.1. A description of how sampling depths will be adjusted has been added to Section 3.1.1.

Comment 26: **Page 3-4: In 1st line change "anticipated that bedrock" to "anticipated that limestone bedrock". Also, in section 3.2.1.2 it states piezometers will be installed in barren areas, according to Figure 3-2 there are no barren areas.**

Response 26: Agreed. The text will be revised as requested. The statement in section 3.2.1.2 will be rewritten to explain that the barren area is seen on the historic photo (Figure 1-3). The barren area is not presently there, but is of interest.

Comment 27: **Pages 3-6 and 3-7, 1st pph of Section 3.2.1, 1st pph of Section 3.2.3.2, and 2nd pph of Section 3.2.4.1: Change all five occurrences of "results of the piezometer samples" to "results of the soils and piezometer groundwater samples".**

Response 27: Agreed. The text will be revised as requested.

Comment 28: **Page 3-8, 1st complete pph on pg: If the driller's license/certification is from Ohio make it "by an Ohio licensed/certified driller".**

Response 28: Agreed. The text will be revised to say "by an Ohio licensed/certified driller".

Comment 29: **Page 3-9, 1st group of bullet items: The criteria for temperature, pH, specific conductance, Eh, turbidity, and dissolved oxygen stabilization for well development should be the same as during purging. Copy the purge criteria from page 3-13 of the SSAP to this set of bullets for well development.**

Response 29: Agreed. The purge criteria will be inserted in the requested section.

Comment 30: **Page 3-11, Section 3.2.6, final 2 bullets: Change to "Clean, unused nylon rope" and "Clean, unused Teflon or PVC bailer or clean, decontaminated stainless-steel bailer"...**

Response 30: Agreed. The text will be revised as requested.

Comment 31: **Page 3-14, Section 3.3: Change 2nd and 3rd sentences to read "A total of six sediment samples will be collected from the ditch that surrounds the Former Sellite Building and separates the two AOCs."**

Response 31: Agreed. The text will be revised as requested.

Comment 32: **Page 3-14, Section 3.4: Provide more detail as to how the aliquots will be collected- from the backhoe bucket prior to it being dumped, based on visual &/or olfactory signs of contamination? Also, will the pit be backfilled and if so with what?**

Response 32: Agreed. Section 3.4 will be rewritten to provide more detail on sample collection and post-sampling activities.

Comment 33: **Page 3-15, 1st bullet item: For a previous SSAP the following comment was made for a similar item- "Explain why and how much groundwater will be purged from the well during the abandonment process." The response was- "Purging of groundwater will only be required in the situation where grouting of the well casing occurs. During this type of abandonment, the grout will replace the water within the well and ultimately run out on the ground surface. An explanation will be added explaining why and how much groundwater will be purged from the well during the abandonment process." Please revise this bullet to be in line with the response, "splashing" suggests the grout is being pumped in under too much pressure.**

Response 33: Purging of groundwater will only be required in the situation where grouting of the well casing occurs. During this type of abandonment, the grout will replace the water within the well and ultimately run out on the ground surface. An explanation will be added explaining why and what will be done with the purged groundwater.

Comment 34: **Page 3-16, Section 3.9, "white/red barn area": Isn't there going to be a Shaw office trailer in the Maintenance area? Shaw hasn't used the white/red barn area for staging in a while.**

Response 34: Agreed. "white/red barn area" will be replaced with "Shaw office trailer". The trailer will be located in an area designated by NASA.

Comment 35: **Page 4-2: Change the 3 occurrences of "must" to "will". Also, in Section 4.3 the 1st bullet item should not be bulleted, it qualifies the bullet item that follows it.**

Response 35: The 3 occurrences of "must" will be changed to "will". In **section 4.3, the 1st bullet item will be changed to not contain a bullet.**

Comment 36: **Page 4-3: The first stage of the decon should be a wash and scrub in potable water (no detergent), so add a leading bullet item with something like "Pre-wash and scrub using a brush in potable water." Also, add something like the following after the bullets- "Pre-wash, wash, and rinse waters will be changed at least daily and as they become excessively dirty."**

Response 36: The text will be revised to incorporate the suggested changes.

Comment 37: **Page 6-1, IDW management: What about well drilling fluids and rock core?**

Response 37: Agreed. The text will be revised to include what to do with well drilling fluids and rock cores.

Comment 38: **Page 6-1, Section 6.4, 3rd line: Change appropriate to read "collected from IDW for each AOC". Also, consider adding an accounting of the IDW samples to Table 3-1 and reference the table in this section.**

Response 38: Agreed. The text and Table 3-1 will be revised as requested.

Comment 39: **Page 6-2, final sentence on page: What "instructions" are being referred to?**

Response 39: The intent was to refer the reader back to the first two paragraphs of Section 6.7 (formerly Section 6.4). The last sentence on page 6-2 will be deleted.

Comment 40: **Table 3-1: Add "Sediment" to the title.**

Response 40: Agreed. "Sediment" will be added to the title of Table 3-1.

Comment 41: **Tables 4-1 and 5-1: Add "Sediment" to the title and identify what will be used for the sediment samples. (List "Sediment" with "Soil"?)**

Response 41: Agreed. The Tables 4-1 and 5-1 will be revised as requested.

Reference: Comments from Lannae Long, USACE-Nashville District, received March 29, 2011.

Comment 1: **How are the data, RI characterization, and risk assessment reports going to divided? Will it be two discrete areas, or will the Sellite and Unloading Areas be handled as one exposure unit? I suggest that if the data shows the**

areas should be handled as separate exposure units, the data, RI and risk assessments should be discrete deliverables.

Response 1: As requested by the 5 November 2010 USACE Scope of Work, a single Site Characterization Report for the Former Sellite Building and Unloading Area (Volume 1) was planned to be prepared and submitted. It is agreed that after evaluation of the analytical data, if it would be more appropriate to present and discuss the sites as separate exposure units, that change will be brought to the attention of the USACE and separate deliverables for each site will be generated.

Comment 2: **Section 3.8 para. 2: - Shaw and its sub-contractors must restore the area to pre-investigation conditions where there are no significant ruts, heavy equipment tire depressions, dried earthen piles, etc that could create a walking or driving hazard. This area is traveled by vehicle and foot by USACE, on-site personnel, other contractors, and Shaw and its sub-contractors shall regrade any ruts, depressions, earthen piles that may cause a walking and driving safety hazard. The site shall be restored to the satisfaction of CELRN on-site personnel.**

Response 2: Agreed. The second paragraph of Section 3.8 will be rewritten as requested.

Reference: Comments from Lisa Humphreys and Janet K. Wolfe, USACE-Huntington District, received April 8, 2011.

Comment 1: **Section 2.2, Site-Specific Data Quality Objectives. Although this may be included in the QAPP, it would add clarity to the sampling plan to briefly define the data deliverables to be submitted by the laboratory for the assessment of data quality. Provide this information in the assessment of data quality.**

Response 1: Agreed. A brief discussion of the data deliverable will be included. The laboratory will provide data packages consisting of laboratory receipt documentation, sample prep and run log documentation, calibration forms, QC forms, Form I's, and all raw data generated in support of sample analysis.

Comment 2: **Section 2.2.5, Information Inputs, page 2-5, 2nd par., 2nd bullet. A reference to the reporting limits in Appendix A is needed. For compliance with DoD QSM, the laboratory needs to base the reporting limits on the Limit of Detection (LOD), as defined in the DoD QSM.**

Response 2: Agree. A reference to Appendix A and clarification of the basis for the reporting limits will be added to Section 2.2.5. The reporting limits are based on the LOD as defined in the QSM.

Comment 3: **Section 2.2.7, Decision Rules. Specify which EPA RBSC list is being used (i.e. EPA Region 9, EPA Region 3, etc.).**

Response 3: The groundwater and soil RBSCs will be noted to have been generated from *EPA Region 9, May 2010 criteria.*

Comment 4: **Section 3.0, Field Activities. Provide a list of sampling equipment for the soil, sediment, and pit sampling, similar to the list of groundwater sampling equipment shown in Section 3.2.6.**

Response 4: A list of equipment for soil, sediment, and pit sampling will be included and consist of the following: 1) HTRW borelog, sample collection log, and chain-of-custody, 2) appropriate sample jars and Terra Cores®, if collection of VOCs are required, 3) Clean, stain-less steel bowl and mixing device or new zip-lock baggie, 4) Photoionization detector (PID)/lower explosive limit (LEL), and Cooler packed with ice for sample storage.

Comment 5: **Section 3.0, Field Activities. Discuss procedures for collection of samples for volatiles analysis (i.e. TerraCore with field preservation, etc.). Soil/sediment samples for volatiles analysis should not be homogenized.**

Response 5: Agreed. The text will be revised to include VOC sampling by Terracores.

Comment 6: **Section 3.4, Locomotive Building Maintenance Pit and Sump Sampling. There appears to be a discrepancy between this section and Table 3-1 regarding the number of samples. Table 3-1 specifies 9 samples and Section 3.4 states that 3 samples will be collected. Verify and correct if necessary.**

Response 6: Agreed. Table 3-1 will be corrected to show 3 samples and TOC analysis will be removed.

Comment 7: **Section 4.2, Analytical Program.**

Comment a: **Define the extraction method (solid phase extraction or salting out extraction) that will be used in conjunction with the 8330 method for groundwater.**

Response a: Agree. Liquid samples for Method 8330A will be extracted by SW-846 Method 3535A. Extraction method for aqueous samples for explosives will be added to the Table 4-1 in the analytical program section.

Comment b: **Page 4-2, 2nd par. It is necessary that all applicable analyses meet the applicable requirements of the DoD QSM, Version 4.2.**

Response b: Agree. Both the primary and field split laboratory are DoD ELAP certified to DoD QSM Version 4.2 for all analysis performed at PBOW.

Comment 8: **Section 5.0, Sample Preservation, Packing, and Shipping, page 5-1, 3rd paragraph. State that the samples will be placed in coolers *fill with ice immediately* after collection. Discuss preservation for volatiles analysis.**

Response 8: Agreed. The text will be revised as requested. Soil samples for VOC analysis will be collected using Terra Core® samplers preserved with sodium bisulfate for low and medium level VOC analysis and methanol for high level VOC analysis. If the soil or sediment contains an abundant amount of gravel to prevent use of a Terra Core® sampler, soil for VOC analysis will be placed in a laboratory grade sample jar and filled to eliminate any sample jar headspace. All water samples collected for VOC analysis will be shipped in one cooler with a trip blank.

Comment 9: **Comment by Lisa Humphreys: The title needs to have "Site-Specific Sampling and Analysis Plan (SAP)" somewhere in it. Just calling it a work plan doesn't really detail what it is (it could be a SSHP). Also, front cover and spine needs to include the project number along with detailed title so we know where to put it in the AR/PR.**

Response 9: Reports will state whether it is a SSAP or SSHP on the binder cover. The FUDS project number is included on the bottom left corner of the front cover and on the bottom of the spine.

Reference: Comments from Carol Lee Dona, USACE-CX, received March 24, 2011.

Comment 1: **General: The Draft RI Work Plan states in numerous places that the specific locations of the monitoring wells to be installed will be determined based on the analytical results of samples collected from the piezometers as well as the groundwater directions established from the piezometer water levels. Recommend that the general logic that will be used with the piezometer results be included.**

Response 1: Agreed. In section 3.2, first paragraph; text stating that based on the groundwater piezometer highest analytical result (nitroaromatic, SVOC, or VOC), a monitoring well (source area well) will be installed at that location. Based upon the site groundwater flow direction determined from all temporary piezometers, one well will be installed in a downgradient (downgradient well) area and one will be installed in an upgradient location (upgradient well).

Comment 2: **Page 3-13, stabilization parameter bullets, turbidity: The stability criterion for turbidity for collection of samples is 100 NTU. This value is higher than the reviewer has seen for low-flow sampling. It was also noted that filtered and unfiltered samples for metals will be collected. Recommend that an explanation of the apparently high turbidity upper limit be included, i.e. is this the value that has been found that is necessary for samples at Plum Brook.**

Response 2: Efforts will be made to reduce turbidity to as low as possible. The reference to 100 NTUs will be deleted. Additional text has been added to sections 3.2.4.2 and 3.2.7 clarifying turbidity criteria as well as defining "stability".

Comment 3: **Table 3-2: Of the field water quality parameters, OPR, ferrous iron, and turbidity are listed but dissolved oxygen, conductivity, and pH are not listed. Recommend adding the latter to the table.**

Response 3: Agree. Table 3-2 will be revised as requested.

Reference: Comments from Sam Bass, USACE-CX, received April 11, 2011.

Comment 1: **Page 2-2, Section 2.2.2, first paragraph on page. Please include an explanation of why PCBs and pesticides may be present at the site. The presence of toluene and burned residue explain the need to analyze for VOCs and SVOCs, and the demolition/decontamination of the Sellite Building explain the need for metals analysis, but the PCBs are not so obvious. Pesticides (if present) were most likely used for their intended use and thus would not constitute an actionable release under CERCLA.**

Response 1: References to pesticides have been removed from the text. PCBs are present at most PBOW sites and are thought to be the result of spraying of waste oils to suppress vegetation growth around buildings or were present in paints. Additional text will be added to the work plan to explain the need for PCB sampling.

Comment 2: **Page 2-6, Section 2.2.7, first paragraph. Because analyses include metals and PAHs, detected compounds in these analyte classes should also be compared to background in addition to being compared to risk-based screening levels. Please modify the plan accordingly.**

Response 2: Agree. Screening of metals against site background will be included. Background soil samples were analyzed for metals only. Because a PBOW-specific background data set is not established, there is no background screening steps for PAHs. Please note that non-DoD-related sources of PAHs are evaluated qualitatively in the site characterization report and baseline human health risk assessment. Such sources may include vehicle traffic, leaching from road materials (e.g., asphalt), burning for weed control, and other non-DoD-related burning.

Comment 3: **Page 3-8, Section 3.2.4.1, first paragraph on page. Please provide additional discussion of how monitoring well depths will be determined, i.e., explain "for collection of appropriate groundwater samples". Will overburden wells be installed just above the bedrock contact or at a depth to be determined during drilling (e.g., at the location of a sand seam, etc.). I recognize the gradational nature of the overburden/shale but I'm trying to get a better idea of the "target interval" for the overburden wells.**

Response 3: Agreed. The rationale for well depths will be included in the work plan.

Comment 4: **Page 3-8, Section 3.2.4.1, second paragraph on page. Double casing should be used when installing all bedrock monitoring wells. The current text makes it appear as though double casing will only be used if the upper overburden/shale is contaminated. Even though the overburden may not be contaminated at the time of installation of a bedrock well, it may become contaminated later. We would not want a potential conduit for cross-contamination to exist should contamination of the overburden occur in the future.**

Response 4: Agreed. The sentence "Where necessary, the geologist/geotechnical engineer will anticipate using "double casing" as described in Section 3-10 of EM 1110-1-4000 to install a well through a contaminated upper zone" will be removed and a paragraph describing bedrock well installation with double-casing will be included.

Comment 5: **Page 3-9, Section 3.2.4.2, first paragraph after first list of bullets on page. Well development does not start until after the well has been grouted and sealed. Therefore this paragraph is internally inconsistent, i.e., it states no water will be added to well but then says added water will be from a potable source. There is no problem with adding water to the well to assist with development provided the water to be used has been analyzed PRIOR TO its potential use. If any contaminants are present, the water is not to be added to the well. If the water is uncontaminated, it can be used for development.**

Response 5: Agreed. The sentence "Water will not be added to the well once the well has been grouted and sealed" will be removed. Source water will be sampled and evaluated prior to use in will development.

Comment 6: **Page 3-11, Section 3.2.6. Please add a flow-through cell to the list of field equipment.**

Response 6: Agreed. A flow-through cell will be added to the list of field equipment.

Comment 7: **Page 3-13, Section 3.2.7. Consideration should be given to using a whole-water sampler such as a HydraSleeve in cases where well recovery is so low that low-flow sampling cannot be performed. This would be preferable to repeated bailing/pumping and recovery cycles. There may be potential comparability issues between samples collected using a HydraSleeve and samples collected using low-flow methods, so it is recommended that whole-water samplers be used across the site if needed at all.**

Response 7: Although the HydroSleeve sampler is a good and practical method of groundwater sample collection, the volume of groundwater the HydroSleeve

collects (maximum 1.5 liters) compared to what is usually required during PBOW groundwater sampling, is not adequate for investigative measures.

Comment 8: **Page 3-14, Section 3.3. Please provide explanation for analyzing sediment samples for PCBs. Refer to previous comment #1.**

Response 8: The rationale for sampling for PCBs is related to the use of waste oil for vegetation suppression and the possible presence of PCBs in paint. This information will be added to the report in Section 2.2.

Comment 9: **Page 3-15, Section 3.5. If there is a chance that monitoring wells may be abandoned after the first round because they produce hydrogen sulfide, recommend that surface completion (concrete pad and protective bollards) for new monitoring wells not be completed until after the first sampling round. The well should still be grouted to ground surface and have a protective casing installed to protect the well and prevent immediate infiltration down the borehole, but concrete pad and protective pipes could wait.**

Response 9: There is a chance that a monitoring well may need to be abandoned due to off-gassing of hydrogen sulfide but since the drilling company with the proper tools, equipment, and machinery is already present at the well, it is more cost effective to install the concrete pad and bollards and prevent an additional mob, demobilization charge. If a well needs to be abandoned due to the hydrogen sulfide gassing, the concrete pad and bollards can be removed when the bedrock monitoring well is abandoned.

Comment 10: **Page 3-16, Section 3.6. Clarify that the elevation of the top of riser will be determined for all piezometers and monitoring wells after installation. This is critical to the determination of accurate groundwater elevations so groundwater flow directions can be determined. Also confirm that the horizontal and vertical datum to be used is consistent with the datum used for other wells installed at Plum Brook. I'm assuming that is North American Datum of 1983 for horizontal, and for vertical the National Geodetic Vertical Datum of 1929 (due to its citation in the work plan). Ensure that the North American Vertical Datum, 1988 adjustment has not been used for other wells so all wells will be on the same datum.**

Response 10: All survey measurements for piezometers, soil borings, and monitoring wells for this investigation will be conducted using the North American Datum of 1983 and the 1929 National Geodetic Vertical Datum, as previous investigations. Subcontracted survey personnel will be reminded to use these datum. Information for these survey requirements will be included in Section 3.6.

Comment 11: **Page 4-3, Section 4.3, fourth bullet on page. Rinsing with methanol is appropriate when sampling for organics. When metals are analyzed, the**

rinse agent should consist of 10% nitric or hydrochloric acid. Please correct the work plan accordingly.

Response 11: Agreed. The text will be revised as requested.

Reference: Comments from Chung-Rei Mao, USACE-CX, received on March 18, 2011.

Comment 1: **Page 2-1, Section 2.2.1 and Page 2-5, Section 2.2.5: <u>Project-specific</u> information on data quality needs should be provided besides a general description of the DQO process. For example, what are the Type I and II tolerable decision errors and the project-specific requirements on "Reporting Limits" and their associated precision and bias for this investigation? (See DoD QSM v4.2 on Reporting Limits.) Section 3.3 of the SWSAP covers generic-site-wide data quality needs, instead of project-specific or site-specific data quality needs. Project-specific data quality needs must be developed for individual sites.**

Response 1: Noted. The sampling locations were selected biased toward suspected contaminant sources. Tolerable decision error rates were not set because the judgmental sampling approach does not allow for the assessment of whether or not specific decision error rate limits have been attained. In addition, the project reporting limits were also set at the laboratory's LOQ because the field precision and bias is unknown. Field duplicates and field splits will be collected to monitor field precision and potential bias.

Comment 2: **Page 2-5, Section 2.2.5, 2nd paragraph, 2nd bullet: The "Reporting Limits" should meet DoD QSM Version 4.2 requirements. Please state the procedures for establishing the project-specific reporting limits and the associated precision and bias.**

Response 2: Noted. As defined in the DoD QSM, the RL is the lowest concentration value specified by the client that meets project requirements for reporting quantitative data with known precision and bias for a specific analyte in a specific matrix. The LOQ cannot be greater than the RL. It was determined the laboratory's LOQ met project requirements for quantitative data for this project.

Comment 3: **Page 2-6, Section 2.2.7, 2nd paragraph and Section 2.2.8: The decision rule should include a discussion of tolerable decision errors of Type I and II. Please define the "significant" threats quantitatively.**

Response 3: Noted. Sampling at PBOW is employing a judgmental sampling approach based on historical site knowledge. Samples are biased to areas of potential contamination.

Comment 4: **Page 2-7, Section 2.2.8, last paragraph, last sentence: Please state the data precision and bias requirements quantitatively and describe the**

determination procedures that will meet all phases of the RI and risk assessments.

Response 4: Noted. The sampling locations were selected biased toward suspected contaminant sources. The judgmental sampling approach does not allow for the assessment of whether or not specific decision error rate limits have been attained.

Comment 5: **Page 3-2, Section 3.1, 2nd paragraph: Please clarify that soil/sediment samples for VOC analysis will not be mixed and stored in a plastic bag. Also, clarify the sampling and preservation procedures for low and medium/high concentration soil samples according to EPA Method 5035A.**

Response 5: Agree. Clarification that VOC soil samples are not to be mixed but collected in Terrcores and preserved with sodium bisulfate will be added to Section 3.1. If the sample contains an abundant amount of gravel, preventing the use of a Terra Core® sampler, the sample for VOC analysis will be placed in a laboratory grade sample jar and filled to eliminate any sample jar headspace.

Comment 6: **Pages 3-2 and 3-3, Sections 3.1.1 and 3.1.2, 1st paragraphs: Suggest that the soil samples for VOC analysis be not collected from 0 to 1 foot bgs, especially the top 6", because of the substantial VOC loss due to aeration of surface soils.**

Response 6: Noted. The SOW outlines the sampling protocols and analytical suite by depth intervals. VOCs for surface soils will be collected from 6 inches to 12 inches below ground surface.

Comment 7: **Page 3-8, Section 3.2.4.2, 1st paragraph, last sentence: Please state how much time or how many well volumes should be allowed between consecutive field water quality measurements.**

Response 7: Agree. Field water quality measurements are taken every 15 minutes. This text will be added to Section 3.2.4.2.

Comment 8: **Page 4-2, Section 4.2, 1st paragraph, 2nd sentence: (FYI) Method 8330B may be used for subsurface soil but cost much more.**

Response 8: Noted. The SOW states Method 8330B shall not be used for this work.

Comment 9: **Page 4-2, Section 3.2.4.2, 2nd paragraph, 1st sentence: Please note that the hierarchy of acceptance criteria for SW-846 method QCs is project-specific requirements, DoD QSM v4.2, and SW-846 methods.**

Response 9: Agree. The hierarchy of acceptance criteria will be clarified in Section 3.2.4.2.

Comment 10: **Page 5-1, Section 5.0, 3rd paragraph, 3rd sentence and Table 5-1: Sample should be cooled "4±2°C" or 0 – 6°C. Also, please state how soon a sample shall be shipped after collection.**

Response 10: Agree. Section 5.0 and Table 5-1 will be changed to read "4±2°C" and shipping information added.

Comment 11: **Page 6-2, Section 6.4: Suggest that the procedures for collecting "composite samples" be described or referenced to a project SOP.**

Response 11: Noted. The composite sample referred to in Section 6.4 is for waste characterization only. No decision regarding site conditions are made from these data. It is simply an aliquot from each drum of waste. This meets requirement of the disposal facility.

Comment 12: **Table 3-1: Rinsate samples for "TCL VOC" samples of solid matrices may be exempted because of lost of most VOC during the rinsing procedures and the substantially different method detection limits for VOC samples of aqueous and solid matrices. However, trip blanks should be added for all VOC samples at a rate of one per shipping cooler that contains VOC samples.**

Response 12: Agreed. However, the SOW requires equipment rinsates for every analysis performed. Trip blanks are included in every cooler containing VOCs at a rate of one per cooler.

Comment 13: **Table 4-1: The digestion method for "Dissolved Metals" should be Method 3005A, not 30010A. Also, suggest that the sample P&T method and options for low and medium/high concentration VOCs in solid matrices be specified.**

Response 13: Agree. The method for dissolved metals will be changed to Method 3005A. The soil VOCs will be collected with Terracores and preserved with sodium bisulfate. Only low concentrations (if any) of VOCs are anticipated.

Comment 14: **Table 5-1: The holding time of VOCs in solid matrices should be 14 days; however, if Encore® Sampler is used or not acid preserved, different sample preservation and holding times will be required. Please comply with Method 5035A for the details.**

Response 14: Agree.

Comment 15: **Tables 7-1 ~ 7-: Please state how the "Reporting Limits" were established and also list the precision and bias required at individual reporting limits. Footnote a, "Reporting Limits are based on the LOQ" is not clear and acceptable. Reporting limits shall be established based on project data quality needs, not based on contract labs' performance data, i.e., in-house**

LOQs. Also, because two labs will be used, which lab's LOQs were based on? In addition, the reporting limits for certain analytes may exceed regulatory levels. For example, the MCL of benzo(a)pyrene is 0.2 µg/L but the reporting limit for benzo(a)pyrene in Table 7-2 is 5µg/L. The reporting limits shall be less than the project action levels (which could be regulatory levels, risk-based levels, or background levels, etc.) and how much less than the action levels shall depend on project-specific data quality and tolerable decision errors.

Response 15: Noted. As defined in the DoD QSM, the RL is the lowest concentration value specified by the client that meets project requirements for reporting quantitative data with known precision and bias for a specific analyte in a specific matrix. The LOQ cannot be greater than the RL. It was determined the laboratory's LOQ met project requirements for quantitative data for this project. The LOQs are based on the primary laboratory (Accutest, Orlando). This will be clarified in the footnote. Benzo(a)pyrene is not a constituent of concern at the Garage Maintenance Area, Former Sellite Area, or Unloading Area. If the presence of PAHs were anticipated at any of these sites, the PAHs would be analyzed by the Low-Level SW-846 8270 Method or SW-846 8310. The analytical methods selected for all constituents of concern are current industry state of practice.