



Alabama Department of Environmental Management
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June 2, 2016

Mr. Brett Merkel
ARNG-ILE-C
111 S. George Mason Drive
Arlington, VA 22204

RE: ADEM Response: *Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP)*, dated January 2016.
Mobile OMS-28, Mobile County, Alabama
DSMOA ID: 535-223-0031

Dear Mr. Merkel:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the Alabama Army National Guard's (ALARNG) subject document. Based on this review, the Department has provided comments in the attached document.

A revised UFP-QAPP addressing all comments should be submitted to the Department for review. Responses may be submitted in the form of a revised document or appropriate revised pages and figures to be inserted in the original submission. If ALARNG chooses to submit revised pages, please date or code each page and figure. For example, **25(r-8/22/16)** would be page 25 revised August 22, 2016.

To facilitate the Department's review, please return a copy of the Department's comments with annotations in the left margin which identify the revised pages, figures, tables, etc. where ALARNG's responses to each comment are recorded. In addition, please provide a redline/strikeout version of the revised document. The transmittal letter of the revised document should include a statement certifying that all changes to the revised document are shown in the redline/strikeout version.



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If you have any questions or concerns regarding this matter, please contact Mr. Colin Mitchell of the Governmental Hazardous Waste Branch at 334-271-7967 or via e-mail at cjmitchell@adem.state.al.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen A. Cobb". The signature is fluid and cursive, with the first name "Stephen" being the most prominent part.

Stephen A. Cobb, Chief
Governmental Hazardous Waste Branch
Land Division

Attachment

SAC/ATM/CJM/akr

Cc: Sheri Festoso, ALARNG
Melissa Shirley, USACE Mobile

ATTACHMENT
UFP-QAPP for the ALARNG OMS-28
ADEM Review Comments
Fort Rucker

1. **General Comment:** Please add copies of the mobile laboratory and fixed laboratory Standard Operating Procedures (SOPs) to Appendix B.
2. **Page 3-1, Worksheet #3:** According to Section 2.3.1 of the UFP QAPP Manual, this worksheet should include a list of who will be receiving the QAPP. Please revise.
3. **Page 4-1, Worksheet #4:** According to Section 2.3.2 of the UFP QAPP Manual, this worksheet needs to include all key personnel who will be performing work. Please revise to include the mobile and field laboratory Project Managers and other known AECOM staff included in other worksheets.
4. **Page 5-1, Worksheet #5:**
 - a. Please add ADEM to the organizational chart.
 - b. Vasi Kourlas is listed as Technical Lead/Deputy Project Manager on Worksheet #5, a Quality Assurance Manager on Worksheet #1 and a Task Manager on Worksheet #7. Please revise as needed.
 - c. Please add the AECOM Program Manager, the AECOM QA Program Manager and the AECOM Field Quality Control (QC) Coordinator/Site Safety & Health Plan Officer to the organizational chart.
5. **Page 6-1, Worksheet #6:**
 - a. Please revise this section to explain how ADEM fits into the communication pathways.
 - b. Please add Columbia Technology laboratory to this worksheet.
 - c. Please add the AECOM Program Manager to this worksheet.
6. **Page 10-1, Worksheet #10, and Figure 3:** The conceptual site model should include a discussion of current and potential future groundwater use, groundwater classification, and any legal restrictions on groundwater use for on-site and off-site properties that are or may be impacted by the contaminant plumes. Please revise.
7. **Page 10-2, Section 10.2, Paragraph 4:**
 - a. This paragraph states, "Historically, TCE [trichloroethene] was documented as high as 11 micrograms per liter ($\mu\text{g/L}$) at off-site monitoring well MW-10 and 63 $\mu\text{g/L}$ at MW-11 in 2006. These monitoring wells were installed northwest of the Site, on private residential property. Monitoring wells MW-10 and MW-11 were subsequently abandoned in 2008 at the property owner's request and have not been replaced. Based on analysis of the most current groundwater data (2010), the apparent groundwater flow direction does not appear to indicate that the plume is

or would impact the residential properties to the north of the OMS #28 building. These residential properties are side and/or up gradient of the source and groundwater flow direction.”

There are no monitoring wells between OMS-28-4 and these two abandoned wells to the northwest. Please add a discussion of the historic evidence that the TCE plume has migrated off-site to the northwest. Also, Figure 3 shows the <5 ug/L isopleth as being contained solely within the site boundary. Since MW-10 and MW-11 were abandoned at the owner’s request, it appears that TCE concentrations to the north/northwest of the site are unknown. Please revise Figure 3 to show a dashed line for inferred TCE concentrations between OMS-28-4 and these monitoring wells.

- b. Please clarify whether the property where abandoned wells MW-10 and MW-11 are located is currently developed or could be developed and note the zoning for this property.
 - c. This paragraph states, “Based on the extensive investigative work completed to date, the potential source area for the TCE plume appears to be in the vicinity of monitoring well MW-8.” This monitoring well is located due south of the center of the groundwater plume, indicating a northward groundwater flow direction from MW-8 to OMS-28-3, located in the center of the groundwater plume. Please clarify why the center of the groundwater plume is located north of the potential soil source area, while the plume configuration suggests a more northwesterly plume flow direction.
8. **Page 10-2, Section 10.2, Paragraph 6:** This paragraph states, “PCE groundwater contamination appears to be limited to the area surrounding monitoring well OMS-28-5, which is located within a densely wooded area west of the Site.” There are no monitoring wells to the north and northwest of OMS-28-5 to support this statement. Please revise the text to indicate the lack of data to determine the extent of the PCE plume.
9. **Pages 11-2 to 11-4, Worksheet #11, Table 11.1, Project Quality Objectives:**
- a. **Step 2) Identify the Goals of the Study:**
 - i. This section states that an objective of the study is to “...refine the groundwater plume boundary in order to reduce the area needed for remediation.” Since historic data shows that the TCE plume has migrated off-site, impacting private property, characterization of the extent of the off-site plume is needed to ensure that the remedy addresses the off-site extent of the plume. Please include this as a goal.
 - b. **Step 4) Define the Boundaries of the Study:**
 - i. This step states that Figure 2 shows the site boundary. However, this figure only shows parcel boundaries. Please revise Figure 2 to more clearly show the boundary of the site.
 - ii. **Other Boundaries:**
 1. This section indicates that hypothetical future residents are receptors. Please clarify whether the property where MW-10 and

MW-11 were located is privately owned and also indicate the zoning for this property. If residential development is not prohibited on this property, the future residential exposure scenario is not a hypothetical scenario. Please revise this section to remove references to a hypothetical residential receptor scenario and refer to this exposure scenario as a residential exposure scenario.

2. Please also clarify if on-site recreational use is occurring or may occur in the future. If so, please add recreational receptors to the list of receptors in this section.

c. Step 5) Develop the Analytic Approach:

- i. The field screening methods focus only on trichloroethene (TCE) and tetrachloroethene (PCE). Degradation products should be included in order to characterize the extent of contamination and understand the fate of contaminants. Please address.

ii. Work Implementation Process Evaluation:

1. Please revise the first bullet to clarify that if analytical results from Direct Push Technology (DPT) samples are above the project action limits, then the secondary DPT samples shown on Figure 8 will be collected, noting that DPT results are not sufficient to meet Data Quality Objectives (DQOs) for site characterization or conducting human health risk assessments. Permanent wells must be installed, as further discussed in the following comment.
2. This section states, "Analytical data that meet DQOs...will also be used to assess whether contaminant concentrations pose a potential risk to current and future human and ecological receptors." No permanent wells are proposed beyond the property boundary, yet historic data indicates that the TCE plume has migrated off-site, and it is unknown whether the PCE plume has migrated off-site as well. The extent of the TCE and PCE plumes off-site must be addressed. In order to evaluate human health risks, representative concentrations (RCs) must be calculated for both on-site and off-site exposure domains. Grab samples are not sufficient to characterize groundwater concentration trends, and DPT groundwater samples should only be used for screening purposes. Permanent wells must be installed along the site boundary and off-site to verify the DPT results in accordance with the Alabama Environmental Investigation and Remediation Guidance (AEIRG). Permanent wells are also required along the site property boundary as point of exposure (POE) wells for the required groundwater resource protection evaluation. Representative concentrations from these POE wells need to meet Maximum Contaminant Levels (MCLs), and 3 years of semi-annual or 1-2 years of quarterly data are required to calculate RCs. Please revise the investigation to include the required installation of permanent wells both on-site and off-site. Note that

the installation of permanent wells is mentioned in the introductory paragraph to Worksheet #17.

iii. **Data Evaluation Process Evaluation, Second Bullet:**

1. Please revise this section to refer to the screening criteria as preliminary screening values (PSVs) or project action limits, rather than DQOs.
 2. This bullet states, "If analytical data are below DQOs, then those constituents will not be identified as Constituents of Concern (COCs) and no further investigation is warranted." TCE and PCE degradation may result in increasing concentrations of degradation products which currently may be below the screening criteria. Degradation products should be included as COCs in order to characterize the extent of contamination and understand the fate of contaminants. Please revise.
- d. **Step 6) Specify Performance or Acceptance Criteria:** Cumulative cancer risks must not exceed 1E-05 for each receptor in accordance with AEIRG guidance. Please revise the text accordingly.

10. **Pages 12-1 through 12-9, Worksheet #12:**

a. **Page 12-1, MS/MSD:**

- i. Please revise the Data Quality Indicator (DQI) column to include accuracy as well as precision.
- ii. Please add the percent recovery criteria to the Measurement Performance Criteria column. Note that Section 12.1.7 states that matrix spike/matrix spike duplicate (MS/MSD) recoveries are included in this table.

b. **Page 12-1, Cooler Temperature Blank:** Please revise the Measurement Performance Criteria to ≤ 6 °C.

c. **Page 12-1:** The Department notes that Section 12.2.2 discusses the possibility of submitting field blanks. Please add field blanks to Worksheet #12 if applicable to this investigation.

d. **Page 12-4, Section 12.1.4:** The text states that data from the split samples are used to assess sample handling variability. Please revise this section to state that data from split samples are used to assess comparability of mobile and fixed laboratory data.

e. **Page 12-6, Section 12.2:** As per Section 2.6.2 of the UFP QAPP Manual, sensitivity must also be evaluated. Please add sensitivity to this section as a DQI and add a subsection on sensitivity, evaluating the quantitation limits versus the project action levels. This subsection should also explain how non-detect data with quantitation limits above project levels will be handled in the assessment of data.

f. **Page 12-7, Section 12.2.2:** Please remove the reference to equipment blanks if these are not to be collected. Please note that a comment below on Worksheet #17 may negate this comment.

11. **Page 14-3, Section 14.2.4: Soil Source Area Characterization:**

- a. Please remove the reference to equipment blanks in the last paragraph as these are not to be collected per Worksheets #12 and 17.
 - b. Please revise the last sentence to note that the field QC samples will be sent to the fixed laboratory in addition to the mobile laboratory.
 - c. **Groundwater Plume Delineation:** Please revise the last sentence to note that the field QC samples will be sent to the fixed laboratory in addition to the mobile laboratory.
12. **Page 14-6, Section 14.3.3:**
- a. This section states, “The current and potential future exposure scenarios identified for each site are described in Section 10.4...” Please replace the word “site” with “exposure domain.” Also, this sentence refers to Section 10.4 for the description of the current and future exposure scenarios. However, Section 10.4 only describes current on-site development and activities. Current and future exposure scenarios should describe the receptors and exposure pathways for all receptor groups being evaluated for each exposure domain. Please revise the text accordingly.
 - b. Please clarify why site-specific industrial screening levels will be calculated for soil when industrial Regional Screening Values (RSLs) are available.
 - c. Groundwater screening should be conducted using MCLs, unless a MCL is not available, in which case EPA Tapwater RSLs should be used for preliminary screening. Please revise the text accordingly.
 - d. Please ensure that the toxicity criteria listed in the most recent version of EPA’s RSL table are used in the human health risk assessment.
 - e. In accordance with Table 2-1 of the Alabama Risk-Based Corrective Action (ARBCA) guidance, preliminary screening is conducted with a Hazard Quotient of 0.1. Please revise the text for consistency with the ARBCA guidance and Worksheet #15.
13. **Page 14-7, Section 14.3.5:** The ARBCA guidance requires an evaluation of the potential future vapor intrusion exposure pathway. Therefore, vapor intrusion must be evaluated for off-site private, undeveloped property where it is assumed that a residence could be built overlying the highest groundwater concentrations for the affected off-site property. Please revise the text accordingly.
14. **Page 14-7, to 14-8, Section 14.4.1:** This section states, “A 3-D numerical flow and transport model for Monitored Natural Attenuation and risk assessment evaluation will be developed...” The report should identify data gaps and remedial actions in the case that data are insufficient for adequate modeling.
15. **Page 14-7, Section 14.4:** This section indicates that a human health risk assessment will be conducted. Please clarify which document will include the human health risk assessment.

16. **Page 15-1, Worksheet #15:** The text lists the 2008 ADEM PSVs as a reference. The Department requests that EPA MCLs and RSLs be used in lieu of the ADEM PSVs. Please omit the reference to ADEM PSVs.

17. **Page 15-8, Worksheet #15.4:** Please remove the following footnote:

“MCLs for bromodichloromethane, bromoform, chloroform, and dibromochloromethane are based on the 1998 Final Rule for Disinfectants and Disinfection By-Products: The total for trihalomethanes is 80 µg/L.”

18. **Pages 15-1 through 15-8, Worksheet #15:**
 - a. **Page 15-1, Groundwater, 2nd bullet:** Please revise to “USEPA Tap Water RSLs” instead of “USEPA *Region 4* Tap Water RSLs”.
 - b. **Page 15-6, Worksheet #15.3:** Many of the project screening criteria (PSC) will not be achieved based on the limits of detection (LODs) provided in this worksheet. At a minimum, the laboratory should use a different analytical approach (e.g. selective ion monitoring) to be able to achieve the PSC for trichloroethene, tetrachloroethene, and vinyl chloride.
 - c. **Page 15-8, Worksheet #15.4:** The mobile laboratory’s LOD for trichloroethene (1.0 ug/L) is above the USEPA Tap Water RSL (0.28 ug/L). Please clarify how data will be used from the mobile laboratory when the project action level is not achievable.

19. **Page 17-1, Worksheet #17, Paragraph 2:** Please correct the following reference in the last sentence: “This in turn will be used to re-evaluate the remedial options as outlined in the FS [feasibility study] (*provide reference*).”

20. **Page 17-4, Worksheet #17, Section 17.2:** This section states, “MIP [Membrane Interface Probe] and HPT [Hydraulic Profiling Tool] will initially be used as a field screening tool and samples will be collected via DPT to characterize the soil and groundwater. This information, along with, historical data will be used to reevaluate the remedial alternative presented in the FS and as part of the risk assessment.” However, the introductory paragraph to this worksheet states, “The following sections present the field sampling and analysis plan to refine the extent of soil and groundwater contamination *which will be used in anticipation of future installation of permanent monitoring wells*.” The use of these field screening methods is acceptable to determine placement of permanent wells, but it is not acceptable to use the field screening data to determine the extent of the plume or to evaluate human health risks. Please clarify the apparent discrepancy between the introductory paragraph of this worksheet and Section 17.2, as well as Worksheet #11. Please also refer to ADEM’s comments on Worksheet #11 concerning the use of field screening and DPT data.

21. **Page 17-5, Worksheet #17, Section 17.2.2:** Only one field screening soil sample is proposed within the anticipated source area surrounding MW-8, as shown in Figure 6. Please confirm that step-out low level membrane interface probe (LLMIP) soil

samples will be collected within the anticipated soil source area to ensure that this area is adequately characterized during the DPT soil sampling.

22. **Pages 17-1 through 17-8, Worksheet #17:**
- a. **Page 17-4, Section 17.1.3.2, Groundwater Sampling, last paragraph:**
 - i. Please clarify if equipment blanks will be collected from the peristaltic pump, as noted in the EPA Region 4 SOP in Appendix B. If yes, please update Worksheets #12 and 20 accordingly.
 - b. **Page 17-6, Section 17.2.3, Soil Samples:**
 - i. Please revise the second to last sentence to note that the field QC samples will be sent to the fixed laboratory in addition to the mobile laboratory.
 - ii. Please provide details in this section on the following items:
 1. Collection of potential split samples must be performed at all depth intervals. Since the decision as to which samples will go to the fixed laboratory may not be made until the results from the mobile laboratory are received, this must occur to ensure the samples are not compromised.
 2. Clarification is required as to when the split samples will be designated for analysis and what the basis will be for this designation.
 - c. **Page 17-7, Section 17.2.3, Groundwater Samples:** Please revise the second to last sentence to note that the field QC samples will be sent to the fixed laboratory in addition to the mobile laboratory.
23. **Page 18-1, Worksheet #18:** For the soil samples, please add rows for the samples from the two other depth intervals, the one with the highest photoionization detector (PID) reading and one that is 1 foot above the soil/water interface, as stated in Section 17.2.3.
24. **Pages 19-1 through 19-3, Worksheet #19:**
- a. **Worksheet #19.1**
 - i. **Soil:** Please revise SW5030B to SW5035A.
 - ii. **Soil:** Please add a row for the collection of a sample for percent solids from each location. This will need to be performed in a separate 2-oz. glass bottle.
 - b. **Worksheet #19.2**
 - i. **Soil:** Please change the container to Terracores, as per Worksheet #17.
 - ii. **Soil and Aqueous:** Please remove the extraction holding times and replace with "NA".
 - iii. **Soil:** Please change the analysis holding time to 14 days.
 - iv. **Soil: Preservative:** Please add methanol also, or clarify how the laboratory will deal with samples that have concentrations of volatile organic compounds (VOCs) above their calibration range.
25. **Pages 22-1 through 22-2, Worksheet #22:**
- a. **PID Meter**
 - i. **Acceptance criteria:** Please add $\pm 10\%$ for the calibration span gas.

- ii. The referenced SOP does not discuss PID calibration.
 - b. **Water Quality Parameter Instrument**
 - i. If dissolved oxygen (DO), oxidation reduction potential (ORP), and salinity are being measured, please provide the calibration criteria.
 - ii. The referenced SOP does not discuss the calibration requirements.
 - iii. Please provide details on the number of standards for pH, conductivity and turbidity, and update the acceptance criteria for pH.
 - c. **LLMiHPT: Testing Activity:** Please provide the site-specific standard information for this project, e.g. compounds and concentration.

- 26. **Page 23-3, Worksheet #23.2:** Worksheet #28 also includes SOP CT-EXT-002. Please include here also.

- 27. **Pages 24-1 through 24-7, Worksheet #24:**
 - a. **Page 24-1, Worksheet #24.1: GC/MS: row 1:** Please add 4-bromofluorobenzene (BFB) requirements to the tuning acceptance criteria.
 - b. **Pages 24-1 through 24-3:** Please delete rows not affiliated with gas chromatography/mass spectrometry (GC/MS).
 - c. **Page 24-5, Worksheet #24.s: GC/MS: row 1:** Please add BFB requirements to the tuning acceptance criteria.
 - d. **Pages 24-5 through 24-7:** Please delete rows not affiliated with GC/MS.

- 28. **Pages 25-1 through 25-4, Worksheet #25:** Please remove rows not affiliated with GC/MS on Worksheets #25.1 and 25.2.

- 29. **Pages 28-1 through 28-11, Worksheet #28:**
 - a. **Worksheet #28.1, Surface and Subsurface Soil**
 - i. Please revise the Method/SOP Acceptance Criteria section for Method Blanks to reflect LODs instead of Reporting Limits (RLs), as per Worksheet #15.
 - ii. Please revise the Corrective Action for Surrogates section to reflect the text used for Surrogates in Groundwater on page 28-3.
 - b. **Worksheet #28.1, Groundwater**
 - i. **Method Blanks**
 - 1. Please revise the Method/SOP Acceptance criteria to reflect LODs instead of RLs, as per Worksheet #15.
 - 2. Please add a maximum of 20 samples under Frequency & Number, similar to the Surface and Subsurface Soil table on page 28-1.
 - ii. **LCSs**
 - 1. Please add maximum of 20 samples under Frequency & Number, similar to the Surface and Subsurface Soil table on page 28-1.
 - iii. **MS/MSD**
 - 1. Please add “or as specified by client request” under Frequency & Number, similar to the Surface and Subsurface Soil table on page 28-1.
 - c. **Worksheet #28.2, Surface and Subsurface Soil.**

