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MCRD PARRIS ISLAND
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U S NAVY RESPONSES TO U S EPA REGION IV COMMENTS ON SAMPLING AND
ANALYSIS PLAN FOR SITE 55, SITE 9 AND SITE 16 MCRD PARRIS ISLAND SC
11/1/2010
NAVAL FACILITIES ENGINEERING COMMAND SOUTHEAST

GENERAL COMMENTS:

1. **Comment:** Since the Navy has proceeded at risk, comments are being provided to clarify the record in certain cases, however, since a finalized SAP was not approved prior to the Navy proceeding to the field, the Navy may have to return to the field at some point in the future to provide data which the regulators require.

Response: Comment noted.

2. **Comment:** EPA now understands the Remedial Investigation (RI) data gaps are to be addressed in the Site 55, 9, and 16 SAP, therefore, comments previously submitted regarding the RI Phase I and II work plans, as well as feedback on Vapor Intrusion issues, would apply to this SAP. However, recognize that some of the data gaps identified actually pertain to the area within the Site 27 boundary. Regardless, the data gaps should be filled in one SAP or the other. Please refer to previously submitted comments, emails, meeting minutes, etc. as appropriate. EPA understands the Navy believes all items have been addressed, but please ensure this is the case.

Response: The Navy believes that the sampling event for Site 27, Site 55, Site 9, and Site 16 was adequate to fill previously identified data gaps at these sites.

3. **Comment:** Given the purpose of the Fiber Optic Vault (FOV) investigation is to delineate the LNAPL contamination, comments previously submitted regarding the LNAPL delineation would apply here in general. This would include the Site 27 CSM comments, feedback on the Pre-IRA memo, etc. Please refer to previously submitted comments, emails, meeting minutes, etc. as appropriate. EPA understands the Navy believes all items have been addressed, but please ensure this is the case.

Response: The Navy believes that the sampling event for Site 27 and 55 was adequate to further update the LNAPL delineation per EPA's prior comments. Please note that Navy and SCDHEC believed that even prior to this mobilization, LNAPL was adequately characterized and delineated (within Feasibility Study parameters of -30% to +50% on cost) to proceed with consideration of remedial actions.

4. **Comment:** Given the DQOs address the Site 27 Conceptual Site Model (CSM), unresolved comments on the previously submitted Site 27 CSM document would apply here in general, to DQO sections which address the CSM. See previously submitted comments, emails, meeting minutes, etc. as appropriate. EPA understands the Navy believes all items have been addressed, but please ensure this is the case.

Response: The Navy believes that the unresolved comments resulting from the 2007/2008 CSM field event and resultant CSM Report have been addressed with the Site 27, Site 55, Site 9 and Site 16 field events.

5. **Comment:** The problem statement has been revised from the draft Worksheets previously submitted. However, rather than add sufficient detail to clarify the problem, the statement was made much more generic. Under normal circumstances EPA would not accept this problem statement as written, in that it would be insufficient to ensure

DQOs were identified and met. However, since the Navy has proceeded at risk, there is no need to attempt to reach concurrence on the statement. Rather, inclusion of the discussions mentioned in the first Specific Comment listed below will suffice for recordkeeping sakes. However, EPA will expect the navy to return to the field if additional data is needed by the regulators.

Response: Comment noted.

6. **Comment:** Due to the elusiveness of the LANPL and the variety of contaminants it may contain, it is advised that a variety of field techniques be utilized to target soil sample depths within the smear zone, in real time in the field, as opposed to relying on a guideline of “just above the water table”, which could result in the LNAPL being missed. This applies at Site 55, and just across the border of Site 27 downgradient from PAI-27-SO-28, MW11 and FMP 12. EPA has recommended a variety of investigative technologies that could be applied along a continuum of soil core in order to target specific subsample locations. Of these technologies, the FLUTE ribbon is the least expensive (but also potentially least effective). EPA understands the Navy has agreed to use the FLUTE ribbon, along with the other techniques identified in this SAP. Modify the DQO worksheets to address this issue.

Response: EPA’s 16 March 2010 letter to Navy (comment 20) suggested soil vapor screening with an FID, visual observations, odors, hydrophobic dyes, UV fluorescence, and MIP data. EPA recommended that further consideration be given to the use of some of these methods. EPA was provided with information indicating that MIPs would not be particularly effective (i.e., the vendor said that Site 27/55 target compounds were not good MIP responders) and a Ph.D chemist opinion that Laser Induced Fluorescence (or UV fluorescence) would be ineffective because Site 27/55 target compounds would not fluoresce. These techniques are relatively costly, and there was no reasonable expectation of a successful application.

The DQOs, Worksheet 14 and Worksheet 17 were modified to include the use of the PID, Oil-In-Soil™ test kits, TPH Petroflag Test Kits, DDT test kits, and the FLUTE™ NAPL test kits in the field to screen for the presence of LNAPL and to determine if step out samples were required. These field screening techniques were generally chosen based on documented performance evaluations, case studies which utilized these methods and discussions amongst the Parris Island team members. FLUTE ribbon was added based on the recommendation by EPA continuous screening across the entire soil core, although Navy provided a summary of an EPA pilot test that called its effectiveness into question.

7. **Comment:** In general, there is insufficient information to determine if a proper investigation of the LNAPL smear zone will take place. EPA expects the soil core to cross the clay layer and go into the water table some distance, regardless of whether this is “6-8 feet bgs” or further. Modify the worksheets to address this.

Response: The lithology data collected during the 2007/2008 CSM Investigation indicate that the clay layer is present 6-8 feet bgs. Water level measurements indicate the water level is approximately 7 feet bgs. During this investigation, the majority of the borings were advanced 10 feet bgs in order to investigate a potential smear zone beginning within the clay layer and extending into the first few feet of the water table. Several borings were advanced beyond 10 feet at the request of EPA and in order to

install temporary groundwater wells. Once the soil boring is advanced into the saturated zone of the surficial aquifer it becomes impractical to collect soil samples and the data may be more representative of contaminants in the groundwater rather than contaminants in the soil. This can be confirmed with the groundwater analytical results. A description of the nature and extent as well as the fate and transport of contaminants in both soil and groundwater will be presented in the Site 27 and Site 55, 9 and 16 remedial investigation reports. The SAP worksheets were modified as requested.

Please note that Navy and SCDHEC believed that even prior to this mobilization, LNAPL was adequately characterized and delineated (within Feasibility Study parameters of -30% to +50% on cost) to proceed with consideration of remedial actions.

8. **Comment:** If a reaction is seen on the FLUTE ribbon, or by the PID, field test kits should be applied and an analytical sample should be taken and held. DDT and Field test kits should confirm the need to analyze a sample at this location. If no hits are found on the ribbon, or from the PID, or DDT/TPH test kits, an analytical sample may not be necessary.

Response: Comment noted. This strategy was applied during the field sampling event.

9. **Comment:** Additional details were provided regarding field investigation procedures. These should be included in the revised document, along with details about investigating the smear zone.

Response: Please see response to comment 6. This information was added as requested.

10. **Comment:** Figures: EPA has previously requested that MIP locations be included on maps and figures. Preliminary field data already shows the MIP data appears to correlate with field data. The available MIP data may provide more additional vertical delineation information than what is being obtained from the field. Find a way to include the MIP data points on a map with the proposed sample locations for 27/55. Include MIP locations with positive responses on Figures in the future, showing the locations of the MIP data points in relation to the other site investigation locations. Estimate locations if necessary. Revise Figures 10-3, 10-4, and 17-1 to include positive response MIP locations.

Response: The MIP data was collected in 2002. The Navy believes the MIP data are appropriate for screening level data, but are not considered definitive quantitative data that can be used for decision making. Navy has previously pointed out that the MIP contractor stated that Site 27/55 target compounds were poor MIP responders. The MIPS field data were used to select locations for the 2003 groundwater well installation and sampling event. Since that time, the Navy believes that a sufficient amount of definitive quantitative data that is of better quality than the MIPS data has been collected and will be presented in the Site 27 and Site 55, 9 and 16 RI Reports. The Navy has retrieved the MIPS Report from the archives at Columbia Technologies, the company that conducted the MIPS work. The requested information was compiled and made available to AGVIQ for presentation in the Site 27 and 55 EE/CA.

11. **Comment:** EPA commented previously on several additional soils and groundwater samples being needed south of the Site 27/55 border. This has been addressed in part, but EPA expects the step out samples to address remaining concerns.

Response: The Navy believes that the additional samples collected during this investigation and the samples collected from the previously installed groundwater monitoring wells are sufficient to more fully characterize the site. The following step-out samples were collected during this sampling event in the southern portion of Site 27: PAI55SO02A, PAI55SO07A and PAI55SO07B, and PAI-27-38A. There is an archeological area of concern just to the south of Site 27, and this area cannot be disturbed.

SPECIFIC COMMENTS:

12. **Comment:** In the Responses To Comments Section, please include the Objectives, Likely Vertical Location of LNAPL, and Potential existence of LNAPL finger west of MW11 near to PAI-27-SO-28 and FMP 12 discussions and the corresponding Navy responses as you did in the Site 27 SAP. EPA does not intend to address the responses, since the Navy has already proceeded at risk. However, since the Navy bothered to respond to the discussions and included it in the Site 27 SAP, it would also be appropriate to include it in this SAP.

Response: The Site 27 Draft UFP-SAP RTC is included with this response.

13. **Comment:** SAP Worksheet #'s 1, 3, 4, 5, 6, and 7: Based on a review of the Sampling and Analysis Plan, Site 55, 9, and 16 Site Characterization Sampling dated June 2010 (SAP), the following worksheets were found not to be compliant with the Uniform Federal Policy for Quality Assurance Project Plans, EPA-505-B-04-900A dated March 2005 (UFP QAPP Manual): SAP Worksheets #1, #3, #4, #5, #6, and #7. The non-conformances are presented below.

- SAP Worksheet #1, Title and Approval Page, is incomplete, signatures and no dates are provided;
- SAP Worksheet #3, Distribution List, is incomplete as to be determined (TBD) is listed for the Field Operation Leader (FOL) and the Site Safety Officer (SSO);
- SAP Worksheet #4, Project Personnel Sign-Off Sheet, is incomplete as TBD is listed for the FOL and the SSO, and no signatures or dates are provided;
- SAP Worksheet #5, Project Organizational Chart, is incomplete as TBD is listed for the FOL;
- SAP Worksheet #6, Communication Pathways, is incomplete as TBD is listed for the FOL; and
- SAP Worksheet #7, Personnel Responsibilities and Qualification's Table, is incomplete as TBD is listed for the Feasibility Study (FS) Engineer, the SSO, and the FOL.

Ensure that the final SAP includes this missing information for the record.

Response: The final SAP will be completed with the appropriate information as requested. Regulator signature will be obtained upon approval of final document.

14. **Comment:** Worksheet #9, Project Scoping Session Participants Sheet, the first paragraph on Page 21 of 114: The SAP discusses that in order to support the construction phase at Sites 55 and 27, Tetra Tech will evaluate risks to construction workers, industrial workers, and hypothetical future residents. Additionally, the text in SAP Worksheet #10, Conceptual Site Model, Section 10.3.3, Human Health Receptors and Exposure Pathways, Page 30 of 114, indicates human health risks to maintenance workers, industrial workers, construction workers, future construction workers, future industrial workers, and hypothetical future residents will be evaluated. Furthermore, the text in SAP Worksheet #11, Data Quality Objectives: Sites 55, 9 and 16, Section 11.1, Problem Statement, Page 31 of 114, indicates that risks to construction workers, future industrial workers, or hypothetical residents from exposure to environmental media within Sites 55, 9 and 16 will be evaluated to determine if the risks are unacceptable following additional data collection. However, the worksheets are not consistent with the risk scenarios presented in Figure 10-5, Conceptual Site Model. Revise the Draft SAP so the various risk scenarios evaluated for each area are reported consistently throughout the Draft SAP text, figures, and tables.

Before submittal of the revised QAPP, including the risk assessment methodologies, EPA suggests the PI Team discuss what type of risk assessment is needed for which areas of which sites and at what point in time. EPA's understanding of the Navy's proposed path forward was that the Navy would include a risk assessment intermediate in scope between the limited risk evaluation performed for emergency responses and the conventional baseline risk assessment normally conducted for remedial actions, as is required to be done as part of the EE/CA for a removal action. EPA is assuming this would be done as part of the EE/CA, as opposed to now. Once a Removal Action Work Plan is submitted and approved, the Navy would then remove the LNAPL, get post-removal data, which in turn would be used in combination with the remainder of site data from this event (RI data gaps, new gw baseline data, etc.) to perform a risk assessment to determine if further remediation would be needed after the removal action. Furthermore, it is not clear if Sites 9 and 16 are to follow the exact same risk assessment methodology as 55, since they do not apparently have LNAPL present, but may need some type of removal anyway. So this risk assessment, while perhaps planned for now, would not be completed until after the removal. However, an interim report of some kind will be needed to provide data to the removal contractor to form the basis of the Removal Action Memo, EE/CA, RAWP, etc. Therefore, it may not be appropriate to conduct the full risk assessment at this point in time, but rather provide a report analyzing and summarizing the data for the record and for use in the removal documentation process. The final completed RI Report should be submitted after the post-removal data has been gathered. Please consider these suggestions in your response to the paragraph above and below. (This same set of questions may apply to Site 27, since it appears a removal may need to be conducted within the Site 27 boundary as well.)

So, after discussing this with the team, but before making the consistency corrections called for in the paragraph above, please explain exactly when, how, and to where, the risk assessments in this document will be applied, and by using which data, and what reports will be generated at which point in time.

Response: The Navy agrees with the path forward for the removal action and risk assessments as presented above. Currently, Tetra Tech has provided data summaries to AGVIQ including data that was collected during this investigation that will be used in

the risk assessment required for the EE/CA. Tetra Tech will conduct a risk assessment for the appropriate scenarios following the removal action and collection of post-removal data which will also incorporate previously collected data from undisturbed areas.. The team will have input to the risk assessment that will be presented in the Sites 27 and 55/9/16 RI Report when it comes to that point in the process. Additional text was added to Section 10.3.3 and Appendix C to clarify what data would be used.

15. **Comment:** Worksheet #9, Project Scoping Session Participants Sheet, the first paragraph on Page 21 of 114: The text states that “(MILCON) monies for construction expire September 2012, and construction must be complete by that time.” At a separate point in time MCRD explained to EPA that the monies will only expire if the project has not *started*, as opposed to if the project is not *complete*. Additionally, it was explained that “starting” the project could mean a variety of things from very minor to major. For the record, please clarify which explanation is correct, or provide a correct explanation otherwise.

Response: The information contained in Worksheet #9 is a correct record of the scoping discussion. Any future clarification or refinement of the MILCON scope is beyond SAP requirements and is provided to the Team via more appropriate vehicles.

16. **Comment:** Worksheet #10, Conceptual Site Model, Section 10.1 Site Background: The Site 9 discussion mentions that “a site cleanup was performed and 6 inches of surface soil were removed and the area was covered”. Please explain the disposition of the removed soils.

Response: The Navy is in the process of retrieving that information, if available, from the Depot. Any information that is obtained describing the disposition of soils will be presented in the RI Report for Sites 55/9/16.

17. **Comment:** Worksheet #10, Conceptual Site Model, Section 10.1 Site Background: The last paragraph mentions buildings referenced by number. Please ensure that all building are numbered on Figure 17-1 so that mentioned facilities can be located.

Response: Building numbers have been added to Figure 17-1.

18. **Comment:** EPA previously provided the following comment: “SAP Worksheet 10, Section 10.2.2, Petroleum Hydrocarbons Removal – Site 55 (2001 and 2003), Page 10-3: This section discusses that petroleum hydrocarbon LNAPL and water were removed from the FOV, Site 55, in 2001 and again in 2003. This section indicates that free product and water removal from the vault were conducted as a previous investigation and removal action. However, it is not clear from the text whether the removal of free product and water was conducted as a CERCLA clean-up removal action as indicated in this section. The volumes of free product and water removed during 2001 and 2003 and their disposition were not reported in this section. Additionally, subsurface soil most likely contaminated due to the presence of free product in the FOV would have had to have been excavated to some depth below the ground surface to facilitate the installation of the FOV. As such, the soil volumes removed and ultimate disposition of the soils was not reported in this section. If the Navy is intending for the free product removal being conducted as a CERCLA “previous investigation and remedial action” the volumes of free product/water and soil removed from Site 55 and their ultimate disposition should be included in the SAP. Alternatively, provide a brief statement as to

the type of operational action which occurred and disposition of soils/materials removed, as well as provide a reference of where the detailed data and information can be located.”

In the Site 27 SAP, the Navy replied that the action was taken as a maintenance activity and that additional details would be provided later. In the Site 55 SAP RTCs, the Navy states that the site was not an FFA site yet, and therefore limited information would be available. However, in the body of the text the Navy states that “Site 55 was initially included under the Underground Storage Tank program.” The text goes on to state that the tank was installed in approximately 2001. MCRD was listed as a National Priorities List (NPL) site on December 16, 1994. By 2001, MCRD should have known to document the disposition of such contamination coming from a CERCLA site (FFA or not), as well as it seems records would have likely been kept under the UST program. Please advise when and in what manner the Navy will provide information pertaining to disposition of the soils and water removed from Site 55.

Response: The pumping of the vault and the disposition of the pumped water and excavated soils took place while the site was still in the UST Program. It was not intended as a CERCLA Removal Action. The Navy is in the process of retrieving whatever information may be available from the Depot. Any information that is obtained describing the disposition of the pumped water will be presented in the Site History sections of the RI Report for Sites 27 and 55/9/16.

19. **Comment:** Worksheet #10, Conceptual Site Model, Figure 10-5: In Figure 10-5, the arrow indicating the positioning of the LNAPL points to the top of the perched water table. However, as discussed in EPA’s previous comments, the more likely location of the LNAPL is on top of the semi-confined water table just below the clay layer. Please add an arrow and dotted lines to indicate this location as well. (Note: The dotted lines may need to be white in order to show up next to the clay, or if black, dropped down just low enough to show).

Response: The CSM figure has been revised.

20. **Comment:** Worksheet #10, Conceptual Site Model, Section 10.3.2: In the last paragraph prior to Section 10.3.3, the text states the groundwater at Sites 9 and 16 likely flows to the northwest. However, potentiometric surface maps in the RI Work Plan Addendum (July 2008), Figure 2-6 and 2-7, indicate groundwater flow is the northeast in direction. Approval of the placement of the temporary wells planned for Sites 9 and 16 is dependent upon clarification of flow direction. Please clarify in the text which groundwater flow direction is correct for Sites 9 and 16. Also, please include potentiometric surface maps for all sites in this document.

Response: The text in Worksheet 10 Section 10.3.2 has been updated to show the correct groundwater flow direction (to the northeast). AGVIQ will include the current potentiometric surface maps (based on data collected in this investigation) in the Sites 27 and 55 EE/CA.

Comment: Worksheet #10, Conceptual Site Model, Section 10.3.3, Human Health Receptors and Exposure Pathways, and Appendix C: According to the Table of Content, Appendix C is reportedly the Human Health Risk Assessment (HHRA) Methodology. The text in this section does not reference Appendix C, as perhaps it

should. Also, Appendix C does not contain the HHRA methodology for Sites 55, 9, and 16, but rather appears to contain Site 27 HHRA methodology. Please provide the subject HHRA methodology for Sites 55, 9, and 16. A review of the appendix material cannot be completed at this time since it is unclear exactly what scenarios, etc., are to be considered for each of the three sites. Comments above point out inconsistencies in this information across various worksheets. Appendix C will have to be reviewed after the inconsistencies are resolved, the path forward is clarified, and the correct methodologies are provided. (See comment # 14 above.)

Response: Reference to Appendix C was added to Worksheet 10 Section 10.3.3. HHRA methodology has been updated to represent procedures for Sites 55, 9 and 16.

21. **Comment:** Worksheet #10, Conceptual Site Model, Section 10.3.3, Human Health Receptors and Exposure Pathways: The discussion on HHRA also discusses Eco Risk Assessment. Either revise the title of this subsection or create a subsection for Eco risk, even though it states an Eco risk assessment will not be conducted. In that discussion, add a sentence that states if it is found that contaminated groundwater has reached the marsh area and may be surfacing or discharging to surface waters/sediments, an eco risk assessment may be necessary.

Response: Worksheet 10 Section 10.3.3 has been revised as suggested.

22. **Comment:** Worksheet #11, Data Quality Objectives, Site 27, Section 11.1, Problem Statement: The problem statement falls short of capturing everything that needs to be addressed at Sites 55, 9, and 16. EPA's previous discussion on objectives of the investigation and the Navy's responses more fully address the breadth and depth of the problem being addressed and objectives of the investigation. (See RTCs in the front of the document.) However, since the field work has been completed at risk, it is not necessary to revise the statement at this time except as requested in other comments herein.

Response: Comment noted.

23. **Comment:** Worksheet #11, Data Quality Objectives, Site 55, 9, and 16, Section 11.2, Information Inputs, item number 2, Page 31 of 114: The text lists the use of a PID as a field screening method, but Appendix B does not describe the actual application of the method. For the record, in Appendix B please describe how the PID was used in the field to obtain a near continuous screening.

Response: The manufacturer instructions are used in place of the SOP for field use and calibration. A description of how the PID results were used to make field sampling decisions is presented in Worksheet 17. The PID results were used to determine from which interval of the soil boring should be used for Oil-In-Soil™ test kits, TPH Petroflag Test Kits, and DDT test kits and to determine where to collect soil for submittal to a fixed base laboratory for analysis.

24. **Comment:** Worksheet #11, Data Quality Objectives, Site 55, 9, and 16, Section 11.2, Information Inputs, item number 2, Page 31 of 120: The text states Oil-In-Soil will be used, but EPA previously recommended a variety of methods which would provide a continuous screening along the core (See previous EPA comments). Since the issuance

of this draft document, the Navy agreed to the use of the FLUTE ribbon. Please include it in the list of field screening methods and provide instructions for use in Appendix B.

Response: Text was added to worksheet 11 Section 11.2 to include FLUTE ribbons. The manufacturer's instruction for the use of FLUTE ribbon in the field will be added to Appendix B. Worksheet 17 describes the FLUTE ribbon field implementation. Also see the response to Comment 6 discussing how the variety of methods for continuous screening provided by EPA was resolved.

25. **Comment:** Worksheet #11, Data Quality Objectives, Site 55, 9, and 16, Section 11.2, Information Inputs, item number 4, Page 32 of 114: The text states that groundwater samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCB), pesticides, and target analyte list (TAL) metals, and soil samples will be analyzed for target compound list (TCL) VOCs, SVOCs, PCBs, pesticides and TAL metals. However, multiple worksheets such as SAP Worksheet #18 and #20 do not appear to include pesticide analysis for groundwater samples. Please modify Worksheets 18 and 20 to address pesticide analysis for groundwater samples.

Response: Pesticide analysis was inadvertently left out of the aforementioned sections and has now been included in appropriate worksheets.

26. **Comment:** Worksheet #11, Data Quality Objectives, Site 55, 9, and 16, Section 11.2, Information Inputs, item number 4, Page 32 of 114: The text states that groundwater samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCB), pesticides, and target analyte list (TAL) metals, and soil samples will be analyzed for target compound list (TCL) VOCs, SVOCs, PCBs, pesticides and TAL metals. However, multiple worksheets such as SAP Worksheet #18, Sampling Location and Methods/SOP Requirements Table; SAP Worksheet #19, Analytical SOP Requirements Table; SAP Worksheet #23, Analytical SOP References Table; and SAP Worksheet #24, Analytical Instrument Calibration Table, include analyses for diesel range organics (DRO), gasoline range organics (GRO), and polycyclic aromatic hydrocarbons (PAHs). According to SAP Worksheet #11, DRO, GRO, and PAH analysis are not required data needs for soil, and PAH analysis is not required for groundwater. In previous conversations with the Navy, it was mentioned that this was a cut and paste error. However, on further review of the document, it was noticed that Section 10.1, page 24 of 114 mentions that "while site 9 was active, personnel from the Paint Shop placed liquid paint waste and paint strippers in the storage drums. The paint wastes generally consisted of mineral spirits, kerosene, and diesel fuels and the paint strippers were likely methylene chloride." Keeping in mind these potential contaminants at Site 9, please explain if these analysis are needed, and if so, at which sites. Revise the Draft SAP to indicate which analysis are needed at which sites and remove information regarding chemical analyses that will not be performed at certain sites. Ensure consistency of the analyte list by site throughout the SAP.

Response: DRO and GRO were inadvertently included in several worksheets but were deleted in the final SAP. DRO and GRO were not measured in soil or groundwater because full suite SVOCs and VOCs are being analyzed. PAHs were analyzed in the soil and groundwater collected at Site 55, 9, and 16.

27. **Comment:** Worksheet #11, Data Quality Objectives, Site 55, 9, and 16, Section 11.2, Information Inputs, item number 5, Page 32 of 114: The text indicates a comprehensive list of the relevant environmental and medium-specific risk-based screening levels and regulatory standards will be used as PALs during this investigation. The text further states that positive detections from the DDT EnviroGuard test kit, which has a method detection limit (MDL) of 0.2 milligrams per kilogram (mg/kg), will result in the collection of step out soil samples. However, the PAL for DDT as listed in SAP Worksheet #15, Reference Limits and Evaluation Table, is 0.067 mg/kg (Page 48 of 114). As such, it has not been clearly presented in the Draft SAP how the step out sampling will be conducted to achieve the PAL of 0.067 mg/kg since the DDT test kit has a MDL that is almost three times higher than the PAL. Additionally, the text in SAP Worksheet #11, Section 11.2, item number 2, Page 31 of 114, indicates the EnviroGuard DDT field test kit will be used for delineation of DDT or “other chlorinated hydrocarbons such as chlorobenzene.” The chlorobenzene PAL listed in SAP Worksheet #15 is 0.062 mg/kg (Page 43 of 114). However, SAP Worksheet #11 does not indicate the MDL for chlorobenzene. Similar to the issues identified with the DDT field test kit MDL and the PAL, it is not clearly presented in the Draft SAP how step out sampling using the test kit results will achieve the delineation of chlorobenzene in soil, based on the respective PAL. Revise the Draft SAP to address this issue.

Response: The field screening methods proposed were intended to investigate and delineate the primary contaminants at the site, which include DDT and chlorobenzene, Step out samples were collected based on a positive result from a field screening sample, as described in PALs, information inputs, WS 11 and in WS 17. The field screening and step out samples were analyzed in the laboratory for all analytes, and samples were collected spaced 50 feet apart, therefore the Navy believes the risk were delineated to screening values. The intention of the field screening samples was to conduct initial delineation on a presence/absence basis. The laboratory results were used for final decision making.

28. **Comment:** Worksheet #11, Data Quality Objectives, Site 55, 9, and 16, Section 11.4 Analytic Approach: In the Delineation Decision Rule, add “surface of the semi-confined” to the parenthetical statement after “... below the” and before “water table”.

Response: The decision rule has been revised to include the suggested language.

29. **Comment:** Worksheet #11, Data Quality Objectives, Site 27, Section 11.4 Analytic Approach: The Risk Assessment Decision Rule will be reviewed fully after the risk assessment methodology has been presented in Appendix C.

Response: Comment noted.

30. **Comment:** Worksheet #14, Summary of Project Tasks, Soil Sampling: The second paragraph states the soil borings will be advanced to an estimate of 8 feet bgs. The soil boring should be advanced past the clay layer and into the saturated soils below the surface of the semi-confined water table, regardless of the feet bgs. If the clay layer is not encountered within a reasonable depth according to where nearby cores encountered the clay layer, then the core can be stopped shortly after passing the top of the water table.

Response: Agreed. See Response to comment 7 above.

31. **Comment:** Worksheet #14, Summary of Project Tasks, Soil Sampling: Update the third paragraph to include the FLUTE ribbon, since that has been decided already.

Response: Text was revised to include FLUTE ribbon.

32. **Comment:** Worksheet #14, Summary of Project Tasks, Groundwater Sampling and/or water level Measurements: Wells should be checked for LNAPL prior to purging or any disturbance. All groundwater samples should also be analyzed for pesticides.

Response: Text was updated in Worksheet 14 to include a check for LNAPL prior to water level measurements, purging, or groundwater sampling. All groundwater samples were analyzed for pesticides.

33. **Comment:** Worksheet #16, Project Schedule/Timeline Table: Please update the table based on actual dates due to proceeding at risk, and update projected dates not yet passed.

Response: Worksheet 16 has been revised.

34. **Comment:** Worksheet #17, Sampling Design and Rationale, Soil Sampling: The plan specifies subsurface soil samples will be collected in the 6-8 feet zone, as opposed to being from the clay layer and/or the saturated zone at/just below the surface of the semi-confined water table, regardless if this depth is in the 6-8 feet bgs interval or not. This is not consistent with other SAP worksheets (or as comments instruct). Revise this subsection of SAP Worksheet #17 to be consistent with SAP Worksheet #11, Data Quality Objectives: Sites 55, 9 and 16, Section 11.3, Study Area Boundaries, and Section 11.4, Analytic Approach; and SAP Worksheet #18, Sampling Locations and Methods/SOPs Requirements Table, which should now indicate soil samples will be collected from the saturated zone. Clarify in all of these worksheets that the investigation area is to include the clay layer and the saturated soils just below, regardless of whether this is within the 6-8 feet bgs area or not. The same comment applies to Sites 9 and 16.

Response: The above worksheets have been revised to include soil sampling into the saturated zone, regardless of the depth of that zone. The language in the SAP is used as a general reference. If the clay layer was located at a depth beyond 8 feet, a sample was collected at the depth below the clay layer in the saturated zone.

35. **Comment:** Worksheet #17, Sampling Design and Rationale, the subsection titled Soil Sampling on Page 61 of 114: The text discusses the details of the soil sampling activities. However, due to recent conversations between the United States Environmental Protection Agency (EPA) and the Navy, it was agreed to utilize a ribbon non-aqueous phase liquid (NAPL) sampler as a field screening method for the detection of NAPL. Revise all relevant Draft SAP worksheets to indicate the use of ribbon NAPL samplers during soil sampling activities and include relevant standard operating procedures (SOPs) needed for deployment to reflect recent agreements regarding the sampling for NAPL. This same comment applies to Sites 9 and 16.

Response: The FLUTE ribbon was utilized during the sampling event. All respective Worksheet were updated to reflect the use of the FLUTE ribbon.

36. **Comment:** Figure 17-1, Proposed Sample Locations: Additional soil sampling locations are recommended for the NW corner of the FOV Exposure Area to ensure the proper depth is investigated and to prevent a data gap in this area (i.e., a uniform sampling grid over the entire FOV Exposure Area is recommended – see FOV comments). This grid could be continued into the Motor-T area to investigate the areas of elevated contamination along the boundary between the two investigation areas.

Response: See the final sample location figure which presents all of the proposed and final sample locations for this investigation. Additional samples were collected in the NW corner.

37. **Comment:** Figure 17-1, Proposed Sample Locations: The placement of TW at Sites 9 and 16 can only be approved after clarification of the groundwater flow direction. See previous comments regarding Site 9 and 16 background info and potentiometric surface maps.

Response: The groundwater flow direction was previously determined during the Site 27 CSM investigation. Potentiometric surface maps from the CSM have been added to the SAP as new Figures 10-3 and 10-4.

38. **Comment:** Worksheet #18 and #20: These tables do not accurately present the analysis in that pesticides have been omitted from groundwater analysis. Please correct the tables.

Response: The worksheets have been revised to include the appropriate analyte groups for each sampled media.

39. **Comment:** SAP Worksheet #32, Assessment Findings and Corrective Action Responses: The worksheet does not indicate that EPA should be notified of significant corrective actions. Revise the worksheet to indicate that EPA will be notified of significant corrective actions.

Response: This worksheet is intended to capture the audit of each individual laboratory for their certification. If the laboratory does not meet requirements they will not be certified and they will not be available for procurement by Tetra Tech or for any Navy related work in South Carolina. If the selected laboratory was to lose their certification, EPA would be notified because Tetra Tech would have to procure a new laboratory and the SAP would have to be amended. The worksheet was not revised because EPA notification is not included in this part of the process.

40. **Comment:** Figure 10-6: The legend in Figure 10-6, Cross Section B-B', indicates the groundwater elevation is referenced to "feet below top of casing". However, the scale in the cross section indicates the elevation is referenced to "feet above mean sea level". Additionally, the word "Site" is misspelled in the figure title. Revise the figure as needed to address these issues.

Response: The figure has been revised to include the appropriate elevation references in the legend and on the cross section itself. The other typographical revisions were made.