

N91192.AR.001055  
NIROP FRIDLEY  
5090.3a

LETTER AND THE ATTACHED U S NAVY RESPONSE TO THE U S EPA REGION V  
COMMENTS REGARDING THE DRAFT SAMPLING AND ANALYSIS PLAN FOR SOURCE  
AREA INVESTIGATION REVISION 1 NIROP FRIDLEY MN  
06/18/2013  
RESOLUTION CONSULTANTS

1500 Wells Fargo Building  
440 Monticello Avenue  
Norfolk, VA 23510  
T. 757/306.4000  
F. 757/306.4001

June 18, 2013

Ms. Sheila Desai  
United States Environmental Protection Agency, Region 5  
Superfund Division  
77 West Jackson Blvd.  
Chicago, Illinois 60604

*transmitted via electronic mail*

**Subject: Response to EPA Comments on Sampling and Analysis Plan  
Naval Industrial Reserve Ordinance Plant, Fridley, Minnesota**

Dear Ms. Desai,

Resolution Consultants, on behalf of the Department of the Navy, Naval Facilities Engineering Command Midwest (NAVFAC MW), is providing the enclosed Response to Comments on the Draft Sampling and Analysis Plan, Source Area Investigation, Rev 1, dated March 2013 for the Naval Industrial Reserve Ordinance Plant in Fridley, Minnesota. The Sampling and Analysis Plan will be modified as indicated in the Response to Comments and the revised Sampling and Analysis Plan will be provided to you under separate cover.

If you desire a paper copy of this transmittal or should you have questions regarding this correspondence, please contact Mr. Harvey Pokorny, NAVFAC MW, at (847) 688-2600 ext. 611 or Ms. Chris Boehm Carlson, Resolution Consultants, at (763) 551-2439.

Sincerely yours,



James A. Buss, PG  
Project Hydrogeologist



Christina M. Boehm Carlson, PG  
CTO Project Manager

cc: Harvey Pokorny, NAVFAC MW  
Howard Hickey, NAVFAC MW  
Val Jurka, NAVAFAC LANT  
Deepa de Alwis, MPCA  
Jim Buss, Resolution Consultants  
Cathy Larson, Resolution Consultants



## **Response to EPA Comments on the NIROP SAP Dated March 2013**

### **NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT FRIDLEY, MINNESOTA**

**June 18, 2013**

Each EPA comment on the Sampling and Analysis Plan (SAP) and Navy Responses is included below. Responses to EPA comments below include discussion from May 28, 2013 teaming conference call. We would stress the following points:

1. This proposed project is not a continuation of the remedial investigation. The Navy's investigatory obligations have been completed.
2. This is a Navy voluntary action which can be withdrawn at any time.
3. The purpose is to gather data that the Navy requires to fill in data gaps, assist with system optimization and to provide data for internal use.

#### **GENERAL COMMENTS**

1. The Naval Industrial Reserve Ordnance Plant (NIROP) Fridley Draft Sampling and Analysis Plan for Source Area Investigation, Revision 1, for the NIROP, Fridley Minnesota, dated March 2013 (the SAP) does not present the goals and objectives of the source area investigation consistently. Specifically, Section 10.1 (Introduction) of Worksheet #10 (Conceptual Site Model) includes a list of additional data needs that is not consistent with Section 10.2 (The environmental questions being asked) of Worksheet #10, or with Section 11.2 (Goals of the Study) of Worksheet #11 (Project Quality Objectives/Systematic Planning Process Statements). For example, the data needs in Section 10.1 do not include the goal of evaluating groundwater flow pathways, which is included in the second bullet point in Section 11.2. Similarly, the Section 10.2 question about the baseline concentrations of total organic carbon and iron in the soil at the source areas does not appear to be included in the data needs listed in Section 10.1 or the goals of the study in Section 11.2. There should be a one to one correspondence between the data needs, the environmental questions being asked, and the goals of the study. For example, the data needs should lead to the environmental questions, which in turn will be answered by the goals of the study. Then, the study goals should be used to provide the rationale for each sampling location and sample listed in Worksheet #18 (Location-Specific Sampling Methods/SOP Requirements Table). Revise the SAP to present consistently the goals and objectives of the source area investigation.

**Response:** SAP Worksheets 10 and 11 will be revised to align data needs with environmental questions being asked and goals of the study. The goals on Worksheet #11 will then be referenced to each sample location in Worksheet #18.

2. The SAP does not include decision rules or criteria for making decisions. For example, it is not sufficient to state that "vadose zone soil samples will be collected approximately every five feet for laboratory VOC [volatile organic compound] analysis" because decision rules and criteria for selecting the soil sample intervals that will be sent for laboratory analysis

from the five-foot length of soil core are necessary. Similarly, there are no criteria for selecting screened intervals for monitoring wells. These decision rules and criteria are an essential part of the SAP. Due to the complexity of the decisions that must be made, decision trees may be necessary for some decisions. Revise the SAP to include project decision rules and criteria for making decisions for all project activities, including decision trees as necessary.

**Response:** The SAP will be revised to include decision criteria for the selection of soil samples (criteria will include elevated PID readings, visible NAPL, etc.). With regard to position of the well screen interval, please note that location of wells, both horizontally and vertically, will be reviewed with the EPA and MPCA following completion of MIP and vertical profile boring investigatory efforts.

3. The SAP does not propose the use of any of the simple field screening tools that can be used to evaluate the presence of a dense non-aqueous phase liquid (DNAPL) in soil samples to help select samples for submission to the laboratory. Most proposed soil sample collection locations do not have adjacent membrane interface probe (MIP) borings, so it is unclear how specific sampling intervals will be selected. Also potential evidence of DNAPL from a MIP boring may not be applicable in another boring a few feet away due to the nature of DNAPL migration in the subsurface. It should be recognized that DNAPL may not be observable using the naked eye after it diffuses into clay. Further, several intervals of a five-foot sample may result in elevated photoionization detector (PID) readings, so additional field screening tools may be necessary. For example, ribbon tests or hydrophobic dyes (i.e., in a jar test) could be used to evaluate whether a clay sample contains DNAPL. Revise the SAP to include use of a DNAPL field screening technology or explain, in detail, how samples will be selected for laboratory analysis when several intervals of a five-foot soil core appear to be suitable for laboratory analysis.

**Response:** The application of MIP testing near the East Plating Room, coupled with continuous soil sampling and PID screening, will provide adequate field assessment of subsurface soil conditions to enable selection of samples for laboratory analysis. The SAP will be revised to note that laboratory analytical soil samples will be selected based on the highest MIP/PID reading encountered in a given 5-foot soil core, visible NAPL, etc. If PID readings are uniform over the soil core, analytical samples will be collected from the upper portion of the fine grained soil unit, near its contact with the overlying granular sand layer. We believe the MIP to be a sufficient screening tool for this investigation.

4. The SAP does not present a rationale for why the proposed sample numbers, types, locations and analyses will address the study questions (i.e., in Worksheet #17). Worksheet #17 (Sampling Design and Rationale) states that “the number of sample locations is considered adequate,” but does not explain why the number of locations, analytes, sample depths, etc. are sufficient to meet the study goals. For example, Section 17.2.2 (Vertical Profile Borings and Shallow Vadose Zone Borings) of Worksheet #17 discusses the three borings (VP-1 through VP-3) that will be located in the vicinity of Area Of Concern (AOC) 17, but the three borings are in a northwest-southeast line and will not provide delineation of the lateral extent of groundwater contamination in the AOC-17 area. Without understanding the lateral extent

of the groundwater plume, it is possible that the area with the highest concentrations will be missed. Similarly, several entries indicate that borings will “assess groundwater conditions” in the vicinity of the borings, but this is too vague to be considered a rationale for completion of these borings. The rationale should include the total number of samples to be collected for each medium, including quality control (QC) samples. Revise the SAP to provide a more detailed rationale that clarifies why the proposed sample number, types, locations and analyses (i.e., analytical methods as well as the analyte lists) are sufficient to meet study goals. Ensure this discussion includes the total number of samples to be collected from each medium and why this number of samples is sufficient.

**Response:** The SAP will be revised to include the rationale for the sampling program. This will include the number, type, and location of samples to be collected along with the laboratory analytical work to be performed. We will also include the overall number of QC samples to be included in the program.

Please note that in general, the rationale for the program is to collect an adequate number of samples that will enable remedial option planning. In the case of shallow vadose zone soil samples, the rationale is to collect an adequate number of samples to generate a representative assessment of vadose zone soil impacts near the East Plating Room.

Regarding the distribution of borings near AOC-17, the SAP will be revised to note that the borings are distributed to provide an assessment of the magnitude of vertical impacts, rather than a delineation of the source area, which was defined in the OU3 RI. If the results do not provide adequate assessment of conditions in this area, then contingency boring(s) can be proposed.

5. The SAP does not include a sufficient Triad Approach or flexibility for moving MIP or vertical profile boring locations to delineate areas of interest/concern. Often MIP yields unanticipated results that indicate the need for additional delineation, so flexibility for adjusting locations should be included in the SAP. For example, the MIP-2 location may have high concentrations indicating that sampling is needed to the west of this location or the results of MIP-5 may indicate that samples are needed to the east of this location, but there are no sampling locations proposed in these areas and no flexibility to move locations to delineate the extent of contamination if necessary. The original scope of work, as agreed during the October 12, 2012 meeting, was that eight locations would be selected based on the results of the initial 20 locations, but this approach is not reflected in the SAP. Further, some of the proposed locations appear to be unnecessary, like VP-20, which is adjacent to well UC-69D; VP-25, which is near new extraction well AT-12; and, VP-26 which is near new extraction well AT-13 and monitoring wells 8-8S and MS-37S. At least five locations should be designated as flexible locations to facilitate delineating the extent of source areas using a Triad Approach. If this is not done, an additional investigation to delineate source areas likely will be necessary in the future. Revise the SAP to incorporate a Triad Approach for delineating the extent of source areas and designate at least five sample locations that can be moved to delineate source areas.

**Response:** The SAP will be revised to incorporate flexibility within the overall investigation program and specifically include five contingency vertical profile borings. The MIP logs and analytical data will be provided to the partnering team as they become available and a conference call will be scheduled to discuss placement of the five contingency borings. Please note that vertical profile borings VP-20, VP-25, and VP-26 locations are intended to help provide an assessment of the vertical distribution of water quality at their respective locations.

6. Two boring locations are proposed for AOC 17. However, it is unclear how these borings are sufficient to locate or delineate the source area associated with AOC 17. Revise the SAP to explain how the AOC 17 source area can be located using only two boring locations.

**Response:** Based on previous investigations at the site, AOC-17 is considered a minor source area. The borings proposed (VP-1, VP-2 and VP-3) are not intended to delineate the source area, but rather to assess the conditions at AOC-17 and evaluate if there is a connection to the impacts associated with well MS-31 and/or East Plating Room. The RI for OU3 provides additional delineation data. The text will be revised to state that the borings will provide additional vertical profile data, but the borings are not intended to delineate AOC-17.

7. The SAP states that the soil boring in each soil/groundwater pair will be completed first, then the groundwater boring will be completed. However, groundwater samples should be collected before the borehole for collection of soil samples is grouted so that the water quality is not impacted by the grout and VOCs are not lost due to heating as the cement grout cures. Alternatively, groundwater samples should not be collected until the grout has fully cured and heat generated by this process has dissipated.

**Response:** Abandonment of the vertical profile borings will use a high solids bentonite slurry without concrete which will not generate heat. All soil borings will be completed before initiating the groundwater borings. This will result in a minimum of two weeks between soil borings and groundwater borings at any given location. To the extent practical, we will drill the groundwater borings hydraulically upgradient from the collocated soil boring. MIP borings, however, will be conducted prior to lithology borings to provide the most accurate vertical location of impacts.

8. The SAP does not include the laboratory-specific standard operating procedures (SOPs) and QC acceptance limits. Without this information, the adequacy of the laboratory methods cannot be evaluated, and the ability of the analyses to meet the criteria specified in the SAP cannot be verified. This laboratory-specific information is essential for determining if the study objectives can be met. Revise the SAP to provide the laboratory-specific SOPs and QC acceptance limits.

**Response:** This information will be added to Appendix C and re-titled: "Laboratory Control Limits, Standard Operating Procedures, and Certifications". Laboratory SOPs will be provided for all methods listed on Worksheet #19.

Laboratory control limits were identified on Worksheet #12. In some instances, the control limits were provided via reference to the Department of Defense Quality Systems Manual (DoD QSM). All control limits will be added to Appendix C and referenced on Worksheet #12.

9. The analyses for the investigation derived waste (IDW) (e.g., Toxicity Characteristic Leaching Procedure [TCLP], pH, ignitability, and paint filter test) are not included in all worksheets. For example, Worksheet #23 (Analytical SOP References Table) does not identify the SOPs for these analyses, and Worksheet #30 (Analytical Services Table) does not identify the laboratory that will perform the IDW analyses. Revise the SAP to include the IDW analyses in these worksheets.

**Response:** The requested information will be added to the worksheets.

10. The number and sampling frequencies for QC samples are inconsistently presented in the SAP. The table for soil samples in Worksheet #12 (Field Quality Control Samples) indicates that trip blanks will be collected, and the second footnote for this table indicates equipment rinsate blanks may be collected. However, Worksheet #20 (Field Quality Control Sample Summary Table) does not include equipment rinsate blanks and trip blanks for soil samples. In addition, Worksheet #20 indicates that one equipment rinsate blank will be collected for every ten samples (for a total of 33), but Worksheet #17 (Sampling Design and Rational) (page WS 17-6) and the table for groundwater samples in Worksheet #12 indicate this frequency is one for every 20 samples and 17 equipment blanks are estimated in Worksheet #17. Lastly, Worksheet #18 (Location-Specific Sampling Methods/SOP Requirements Table) identifies different numbers of QC samples (e.g., seven soil field duplicates, five soil matrix spike/matrix spike duplicates [MS/MSDs], and one MS/MSD for groundwater from vertical profile borings) to be collected when compared to Worksheet #20 (e.g., five soil field duplicates, three soil MS/MSDs, and 17 vertical profile groundwater MS/MSDs). Revise the SAP to consistently indicate the numbers and frequencies for the collection of QC samples.

**Response:** Changes will be made as follows:

- The second footnote on Worksheet #12 will be deleted. No equipment blanks are planned for soil samples.
- Worksheet #20 will be changed to include the collection of trip blanks for soil samples.
- Equipment blanks for the groundwater matrix are planned at a frequency of 20%; Worksheets #12, #17, and #20 will be revised to consistently reflect this frequency.
- Worksheet #18 will be revised to match the frequency of QC samples specified on Worksheet #20.

11. Section 27.1.1 (Sample Nomenclature) of Worksheet #27 (Sample Custody Requirements) and Worksheet #18 (Location-Specific Sampling Methods/SOP Requirements Table) indicate that “FD” will be added to the sample identification for field duplicates. However, it is recommended that field duplicate samples not reference the location where they were collected in order to prevent potential bias during analysis. Revise the sample identification

for the duplicate sample to provide a unique number to ensure that the field duplicate sample is submitted to the laboratory as a blind duplicate.

**Response:** Section 27.1.1 will be revised to state that field duplicates will be collected as blind duplicates, labeled sequentially (i.e. FD01, FD02), and no time of collection will be indicated on the chain of custody form. A record of the duplicate pairs will be maintained in the field logbook. Worksheet #18 will also be revised to reflect this change.

12. The data qualifiers listed in the last section of Worksheet #37 (Usability Assessment) on page WS 37-3 are inconsistent with the qualifiers defined in Worksheets #34–36, which do not indicate that M, H, Q, and L qualifiers will be used. Revise the SAP to clarify the qualifiers that will be used for data validation.

**Response:** Worksheet #37 will be revised to be consistent with the qualifiers defined in Worksheets #34 – 36.

13. The SAP does not provide sufficient detail regarding the management of the project data and files. The SAP indicates data will be maintained and uploaded into two databases (i.e., NIRIS and the project database), but does not indicate that data will be verified once entered/uploaded. It is also unclear how validation qualifiers will be incorporated into the databases and data tables of the final report. In addition, the SAP should clearly define where and the length of time that all hard copy and electronic project files will be archived. Worksheet #29 (Project Documents and Records Table) states that laboratory data deliverables will be stored at a third party secure professional document storage firm long-term, but it is unclear what the term “long-term” means and if all files will be archived at this location. Revise the SAP to provide this information for the management of project data and files in accordance with Section 3.5 (Data Management Tasks) of the Uniform Federal Policy for Quality Assurance Project Plans EPA-505-B-04-900A, dated March 2005 (UFP QAPP).

**Response:** Worksheet #29 will be revised to provide additional information on project data management.

14. The project personnel and their responsibilities presented in the SAP are incomplete. Worksheet #7 (Personnel Responsibilities Table) does not include the responsibilities for the Resolution Consultants Project Hydrogeologist and Project Engineer, but identifies a Data Manager who is not included in Worksheet #5. In addition, Worksheet #3 (Distribution List) indicates Ms. Stephanie Warino of Tetra Tech and Mr. Paul Walz of Bay West will receive the SAP, but it is not clear what roles these personnel will have in the current investigation. Furthermore, the SAP does not clarify if validation personnel will be independent from data generation. Revise the SAP to present all project personnel and their responsibilities. In addition, revise the SAP to clarify that personnel performing data validation are independent from the data generation activities.

**Response:** The SAP will be revised to identify project personnel and their responsibilities. The SAP will state that the personnel performing data validation are independent from the data generation activities.

## SPECIFIC COMMENTS

- 1. Executive Summary, Page i:** The last sentence of the second paragraph states, “Source material may contain residual mobile or non-mobile non-aqueous phase liquids (NAPL) or otherwise elevated concentrations of TCE [trichloroethene] and its degradation products that are generally in excess of 10 percent of the solubility limit.” However, DNAPL is considered to be present at a concentration equivalent to 1 percent (%) of the solubility limit of the compound in groundwater. Since DNAPL would only be present in or have migrated from a source area, source material or area should be designated when 1% of the solubility limit is present in groundwater. Revise this sentence to define a source material at 1% of the solubility limit of the compound in groundwater.

**Response:** The Navy is evaluating this definition. We believe that other factors (such as TOC in associated soils) contribute to the presence or absence of NAPL, and this definition is typically site specific. This definition will be removed from the SAP.

- 2. Worksheet #2, Sampling and Analysis Plan Identifying Information, Pages 2-1 to 2-2:** This worksheet does not include the crosswalk table that identifies information required in each section and worksheet of the SAP and references to other documents (if necessary) found within these worksheets. Revise this worksheet to include the crosswalk table with references to other documents when the listed worksheets do not contain the required information.

**Response:** The crosswalk table will be added.

- 3. Worksheet #5, Project Organizational Chart, Page 5-1:** This chart lists two field subcontractors (i.e., Vironex and Mateco), but the contact information for the subcontractors is not provided. Additionally, the Utility Locator subcontractor is identified as TBD (to be determined). Further, Section 11.3 (Inputs to Problem Resolution) of Worksheet #11 (Project Quality Objectives/Systematic Planning Process Statements) indicates a registered land surveyor will survey the locations of the soil borings and monitoring wells, but the surveyor is not identified in Worksheet #5. Revise this chart to include the contact information for the subcontractors and ensure that all subcontractors are identified in the final version of the SAP.

**Response:** Subcontractor names and contact information will be provided in the final version of the SAP.

- 4. Worksheet #6, Communication Pathways, Page WS 6-1:** The table indicates regulatory agencies will be notified when issues arise, but does not provide further information for the type of issues that will necessitate this notification. Revise the table to specify that the EPA and regulatory agencies will be notified when significant corrective actions or changes to the SAP occur.

**Response:** The first line of Worksheet #6 will be revised to read:

The NAVFAC MW RPM will contact each regulatory agency via phone and/or e-mail within 48 hours when significant corrective actions or changes to the SAP occur. This includes notification of significant analytical data quality issues or equipment paradigm failure.

**5. Worksheet #9, Project Scoping Session Participants Sheet, Pages WS 9-1 to WS 9-4:**

This worksheet indicates that five project scoping sessions were held, but the information for who participated and the consensus decisions made is only provided for the October 2012 session, and action items are listed for the October 2012 and January 2013 sessions. Revise this worksheet to provide the participant, consensus decisions, and action item information for all scoping sessions as appropriate (e.g., separate tables completed for each scoping session).

**Response:** Between October 2012 and January 2013, extensive conversations were had between the Navy, Resolution Consultants, EPA, MPCA and contractors which resulted in the current scope of work. Due to the informal nature of the January 2013 discussions, some of the requested information for January 2013 session was not included Worksheet #9.

**6. Worksheet #10, Conceptual Site Model, Page WS-1:** According to the Unified Federal Programs Quality Assurance Project Plan Workbook (UFP/QAPP Workbook), page 14, Worksheet #10 should be titled “Problem Definition,” not “Conceptual Site Model.” The Table of Contents also indicates that the title of Worksheet #10 should be “Problem Definition.” Also, this worksheet is missing the sections “The problem to be addressed by the project,” “A synopsis of secondary data or information from site reports,” and “Project decision conditions (“If..., then...” statements).” It is noted that some of the information provided in Section 10.3 (Observations from any site reconnaissance reports) is a synopsis of secondary data, but additional information should be added. An example of this additional information includes a discussion from the October 12, 2012 meeting associated with the 1997 soil samples which indicated that VOCs were not detected in sandy samples and were only detected in samples collected from fine-grained soils/clay. Revise the title of Worksheet #10 and include the missing sections.

**Response:**

- The title of Worksheet # 10 will be changed from “Conceptual Site Model” to “Problem Definition.
- The section “The Problem to be Addressed by the Project” is included as Section 11.1 “Problem Statement”. This information will also be included in Section 10.1.
- The title of Section 10.3.1 will be changed from “Source Investigation Map” to “A Synopsis of Secondary Data or Information from Site Reports”. The text in this section does state that the highest TCE soil concentrations were recorded within or adjacent to fine-grained materials. Information will be added to state that, as discussed in the October 12, 2012 meeting, VOCs were not detected in sandy samples.
- Although “If..., then...statements” are noted in Section 10 of the UFP QAPP manual, they are also part of the Project Quality Objective (PQO)/Systematic Planning Process Statements as described in Section 2.6 of the Intergovernmental

Data Quality Task Force IDQTF UFP-QAPP Manual and are therefore discussed in Worksheet #11 which is titled “The PQO/Systematic Planning Process Statements”.

The title of Section 11.2 “Goals of the Study” will be changed to “Goals of the Study (If ...,Then Statements)” and the goals will be expressed as if then statements.

7. **Worksheet #10, Conceptual Site Model, Section 10.1, Introduction, Page WS10-1:** The work proposed in the SAP is unlikely to be sufficient to meet the first data need, “Evaluate the nature and location of any source material.” For example, the two borings proposed in AOC 17 are not likely to be sufficient to locate the source area or to fully evaluate the nature of source materials in this area. This data need should be revised so that the work proposed in the SAP can meet the data need or the SAP should acknowledge the potential need for follow-on investigations. Revise the first data need in Section 10.1 so that the work proposed in this SAP can meet the need or acknowledge the potential for follow-on investigations in the text.

Similarly, the third data need cannot be met by the work proposed in this SAP because soil will not be collected for bench-scale testing. The third data need is stated as “Evaluate if source area remediation would accelerate the cleanup timeframe.” Bench-scale testing of source area soil and groundwater should be proposed in the SAP or this data need should be deleted. Revise the SAP to include bench-scale testing or delete the third data need.

**Response:** Section 10.1 of the SAP will be revised to state that contingency borings are included as part of this project and will be used as needed, in consultation with the EPA and MPCA, to address data gaps. The first data need will be revised to “Collect supplemental data to determine the concentrations and vertical extent of impacts in the presumed sources areas”.

The third data need will be modified to read “Collect data to evaluate if source control remediation is warranted and evaluate if bench scale testing is needed to evaluate in-situ remedial options that may accelerate cleanup of the facility”. Bench scale testing is not within the scope of work of this investigatory phase.

8. **Worksheet #10, Conceptual Site Model, Section 10.2, The environmental questions being asked, Page WS10-2:** The SAP should not include first question (i.e., “What constitutes a source area or source material?”) because these definitions are needed to define the criteria that should be used in the project decision conditions/decision rules. For example, if it is decided that concentrations indicative of the presence of a DNAPL, generally 1 percent (%) of the solubility limit of a compound or evidence of DNAPL using a dye or equivalent test, defines a source area, then the decision rules should be written to reflect this approach. Further, the question about what constitutes a source material is vague and should be explained. It is recommended that agreement on these definitions be obtained during a meeting or conference call with the Navy and Regulatory Agencies so that the SAP can be rewritten accordingly. Propose how source areas and source materials be defined and consult with the Navy and Regulatory Agencies to obtain agreement. Then, revise the SAP to

include these definitions and criteria in project decision conditions/decision questions.

**Response:** Comment noted. Environmental Question 1, this question will be removed from the SAP. For the purposes of this project source area or source material will be those locations where in-situ remedial options could be conducted to accelerate the cleanup time. Interpretations of geologic and hydrogeologic conditions, coupled with laboratory analytical results will be central to assessing source areas or source materials that will be the focus of remedial efforts. Question 4 will also be revised to read: “Is the Paint Shop source area contributing to groundwater impacts on the NIROP site and in the NIROP extraction wells?”

**Page WS10-2:** In addition, the work proposed in this SAP is not sufficient to address the fourth question, “Are there source areas not located on the NIROP property may [*sic*] be contributing to groundwater impacts on-site?” The work proposed in the SAP does not appear adequate to delineate contamination that may be migrating onto the site from the north or northwest and does not appear to be sufficient to delineate contamination that may be migrating from the BAE areas of the site. As a result, this question should be deleted or revised to reflect the areas that will be delineated by the work proposed in this SAP. Delete or revise the fourth question to reflect data that will be obtained by the work proposed in this SAP.

**Response:** Regarding the fourth environmental question, the existing data show no significant source area conditions upgradient to the north and northwest. Based on this, there is no need to focus investigations in these areas. The explorations proposed to the south will be evaluated to determine if BAE Paint Shop impacts are migrating onto the NIROP facility and/or towards the NIROP extraction wells.

**Page WS10-2:** Finally, it is not clear how the second part of the sixth question can be answered by the data that will be obtained during this investigation. The sixth question asks, “What are the general soil types in the subsurface and flow pathways for TCE in groundwater?” It will not be possible to evaluate the flow pathways for TCE in groundwater because of the limited number of borings and wells and because tracer tests are not proposed. The second half of the sixth question should be deleted or revised to reflect the limited data that will be obtained by this investigation. Alternatively, the SAP could be revised to propose tracer tests with additional borings to evaluate where the tracer is present. Delete or revise the second half of the sixth question to reflect the data that will be obtained during this investigation.

**Response:** Regarding the sixth environmental question, we disagree with the premise that there will be inadequate data to evaluate flow paths. The extensive groundwater sampling and soil boring lithologic logging will help refine the understanding of the groundwater flow system at the site. We considered tracer tests for this site, but feel the probability of success is quite low relative to the cost. The vertical distribution of TCE from the source areas towards the extraction wells coupled with existing capture zone analysis will reveal TCE flow pathways. This information will be needed to target areas for remediation.

- 9. Worksheet #10, Conceptual Site Model, Section 10.5.2, Analysis of Soil and Groundwater in Vertical Profile Borings, Page WS 10-6:** The last paragraph on page 10-6 states that soil samples “will enable characterization of ... aquitard conditions,” but grain size and permeability testing is not included in the scope of work, so it will not be possible to evaluate whether fine-grained units have the characteristics of an aquitard or an aquiclude. Further, the proposed number of borings may not be sufficient to evaluate whether fine-grained units are continuous. Revise the SAP to include permeability testing or delete the statement about characterizing aquitard conditions.

**Response:** The SAP will be revised to delete the reference to aquitard conditions. More generic descriptions (e.g., fine grained soil units) will be used.

- 10. Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements:** Worksheet #11 does not include answers to the questions listed on page 15 of the UFP-QAPP Workbook. For example, some of the questions that should be answered include, “Who will use the data?,” “What will the data be used for?,” and “How ‘good’ do the data need to be in order to support the environmental decisions?” Revise Worksheet #11 to include the answers to these questions.

**Response:** Worksheet #11 will be revised to include answers to the specified questions. The section will be reorganized and added to as follows:

#### 11.1 Who will use the data?

The Project Team, which consists of the Navy, USEPA Region 5, MPCA, and Resolution Consultants, will use the data to assess the general extent and/or magnitude of source area contamination, and vertical pathway distribution prior to capture. When complete, data will also be available for presentation to the general public to provide status information regarding progress of the site cleanup.

#### 11.2 What will the data be used for?

The data will be used by the project team to adequately characterize the magnitude and/or extent of the potential source areas and to better understand the TCE vertical flow pathways in groundwater. In addition, data will be used to evaluate remedial methods that may be useful in reducing source area concentrations to levels that will allow regulatory control/closure in a timeframe that is acceptable to the project team.

#### 11.4 Goals of the Study (If ..., Then Statements)

The goals of the study are to:

- Assess the vertical magnitude of identified contaminant source areas beneath the NIROP building;
- Assess subsurface soil types and VOC concentrations to gain a better understanding of TCE flow pathways in groundwater;

- Develop baseline data for evaluating potential source area remedial options; and
- Quantify and evaluate VOC concentrations in shallow vadose zone soil near the East Plating Room to support redevelopment activities.

If the investigation results indicate the definitive presence of a source area with conditions favorable for remediation, then remedial options will be evaluated and a work plan for a field scale trial, likely consisting of injection of EZVI, will be prepared.

If no clear treatable source is identified, then results will be reviewed to determine if further investigation could be used to identify treatable source material or if contamination has dispersed to a point where alternate remediation techniques may be preferred.

If subsurface conditions limit the depths achievable using the recommended direct sensing equipment and direct push drilling techniques, then the drilling approach may be modified to include larger drill rigs, modified direct sensing equipment, or a change in the overall scope of work.

11.9 How “good” do the data need to be in order to support the environmental decisions?

In order to support the environmental questions being asked, the data needs to be of sufficient quality to meet the performance measures which include precision, accuracy, comparability representativeness, completeness, and sensitivity described in this SAP.

**11. Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Section 11.3, Inputs to Problem Resolution, Page WS 11-3, Bullet 3; Worksheet #14: Summary of Project Tasks, Section 14.2.1, Field Tasks, Page WS 14-3; and Worksheet #17: Sampling Design and Rationale, Section 17.4.1 Soil Sample Collection from Monitoring Well Borings, Page WS 17-7:** It is unclear if eight soil samples will be collected from each monitoring well borehole or if eight samples will be collected from the three monitoring well boreholes (i.e., two or three samples per boring). Revise the SAP to clarify how many samples will be collected from each monitoring well borehole.

**Response:** The SAP will be revised to clearly state that a total of nine samples will be collected from the three monitoring well soil borings (three samples per monitoring well boring).

**12. Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Section 11.3, Inputs to Problem Resolution, Page WS 11-3, Bullet 4:** The text states that groundwater sample results “will be used to correlate the accuracy of the MIP and vertical profile boring results,” but samples collected from monitoring wells generally have lower concentrations than MIP or grab groundwater samples. Since the MIP provides a continuous profile of VOC concentrations and represents concentrations in groundwater and sorbed to soil particles, the SAP should explain how data from monitoring wells “will be used to correlate the accuracy of the MIP” and provide criteria for this evaluation. Revise the SAP to explain, in detail, how data from monitoring wells will be used to correlate the accuracy of

the MIP and provide criteria for this evaluation.

**Response:** The SAP will be revised to delete the reference to correlation of monitoring well results with MIP and vertical profile results. The MIP screening results and vertical profile boring results will be considered when locating the long term monitoring wells to help select location and screen depth.

- 13. Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Section 11.6, Performance or Acceptance Criteria, Page WS 11-5:** This section indicates that three contingency borings may be needed “to determine the location and depth of the three monitoring wells,” but these contingency borings are not discussed in Section 11.3 (Inputs to Problem Resolution) and are not consistently presented throughout the SAP. In addition, criteria that will be used to determine if these contingency borings are necessary and details about the type of data and samples that will be collected from these borings are not provided. Revise the SAP to fully incorporate the three contingency borings into all relevant Worksheets.

**Response:** The SAP will be revised to discuss the contingency borings in Section 11.3 and a total of five contingency borings will be included in the SAP. General criteria will be offered regarding when and where contingency borings will be used. The project team will evaluate the data to determine if and where the contingency borings will be used. It should be recognized that none of the contingency borings will be employed without notifying the EPA and MPCA of our intention to conduct the contingency borings. A conference call will be held with the EPA and MPCA to review the MIP and lab results and to discuss the proposed contingency boring locations. The contingency borings will be installed during a subsequent mobilization.

- 14. Worksheet #11, Section 11.5, Analytical Approach, Page WS 11-5:** The Minnesota Pollution Control Agency Industrial Soil Reference Values (SRVs) are listed as the project action levels (PALs) for soil, but the SAP does not indicate why industrial levels were selected. Revise this section to provide a rationale for using Industrial SRVs as soil PALs.

**Response:** The future developer is responsible for establishing soil remediation goals. Establishing soil PALs is beyond the scope of this SAP. The Industrial SRV generic screening levels are included in the SAP for comparison purposes because the site is currently used for industrial purposes and has historically been utilized for industrial purposes.

- 15. Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Section 11.6, Performance or Acceptance Criteria, Page WS 11-8:** The text states that the PAL for vinyl chloride in water is less than the laboratory limit of detection (LOD) and that this LOD “is considered adequate for the project needs,” but does not explain why this is the case or how vinyl chloride data will be interpreted. Revise the SAP to explain, in detail, why a LOD for vinyl chloride that is greater than the PAL is acceptable.

**Response:** The paragraph will be revised as follows to address this comment:

The PAL for vinyl chloride in water (0.2 ug/L) is less than the proposed laboratory limit of detection (LOD) of 0.5 ug/L. This LOD is considered acceptable because the goal for the project is to identify TCE source material to allow evaluation of potential remedial actions. The focus of the project is to identify areas of high TCE concentration (above approximately 500 ug/L) rather than to delineate areas to the PALs (previously accomplished in the 2003 RI). Vinyl chloride results will be used to provide information regarding current concentrations for this TCE breakdown product and its distribution throughout the investigation area. Non-detects will be highlighted in the final report to indicate that the LOD is not less than the PAL so that areas of non-detect are not mistakenly interpreted as clean. Vinyl chloride is included in the annual monitoring program with an LOD less than the PAL; thus, groundwater is being monitored through alternative studies at concentrations considered to be protective of human health.

- 16. Worksheet #11, Project Quality Objectives/Systematic Planning Process Statements, Section 11.8, Reporting, Page WS 11-9:** The list of report contents does not specify the type of site figures that will be included. These figures should include a groundwater elevation contour map for the intermediate zone and plan view maps, including a cross-section location figure and maps that depict contaminant concentrations (e.g., spider diagrams or maps that depict contaminant concentrations at discrete depth intervals). Revise the list of report contents or text to specify the types of site figures that will be included in the report.

**Response:** The SAP will be revised to tentatively list figures that will be included in the report. As data is generated and interpreted, this list could change.

- 17. Worksheet #12, Field Quality Control Samples, Page WS 12-1:** The table “Measurement Performance Criteria Table — Field QC Samples for Groundwater Samples” indicates that groundwater field duplicate samples will be collected from a consistent interval rather than at all depths collected for a given boring, but a rationale is not provided. Revise the SAP to provide a rationale for collecting field duplicates at only one depth.

**Response:** The following footnote will be added to the table to provide rationale:

(3) The interval 7 feet below the water table is being targeted for duplicate sample collection to maintain consistency with the groundwater data collected in 1997. One goal of the investigation is to obtain a reliable data baseline set at one depth across the site.

- 18. Worksheet #12, Field Quality Control Samples, Page WS 12-2:** The second footnote for the table “Measurement Performance Criteria Table — Field QC Samples for Soil Samples” indicates equipment rinsate blanks may be collected if decontamination is required. However, this table does not include the measurement performance criteria and frequency for equipment rinsate blanks. Revise this table to include equipment rinsate blanks.

**Response:** No equipment blanks are proposed for the soil matrix. The sampling procedure uses new sampling materials for each sample. Footnote (2) will be deleted.

**19. Worksheet #13, Sources of Secondary Data Criteria and Limitations Table, Page WS**

**13-1:** This table is not consistent with the discussion of previous investigations in Section 10.3 (Observations from any site reconnaissance reports) of Worksheet #10 (Conceptual Site Model). Section 10.3 includes a 2002 OU-3 Remedial Investigation, a 2011 Annual Groundwater Monitoring Report, and a Technical Memorandum with groundwater sampling results from 2012. It also indicates that previous Annual Monitoring Reports (AMRs) have documented the general extent of the groundwater plume. Revise Worksheet #13 to include these AMRs and any other applicable documents with relevant site information, and ensure any limitations on the data use are discussed.

**Response:** The following data sources will be added to the table:

Secondary Data	Data Source	Data Generator(s)	How Data Will Be Used	Limitations on Data Use
Soil and groundwater data	Remedial Investigation for Operable Unit 3 Naval Industrial Reserve Ordnance Plant Fridley, Minnesota, April 2002	Tetra Tech Pittsburgh, Pennsylvania	Incorporate into site figures and discussion, as appropriate	Any limitations cited in the report will be considered limitations for this investigation.
Groundwater Data	2011 Annual Monitoring Report, Naval Industrial Reserve Ordnance Plant Fridley, Minnesota, November 2012	Tetra Tech Pittsburgh, Pennsylvania	Incorporate into site figures and discussion, as appropriate	None.
Vertical distribution of chlorinated solvent locations in groundwater	Technical Memorandum "Discrete Groundwater Sampling Results, Naval Industrial Reserve Ordnance Plan" Fridley, Minnesota, August 31, 2012	AGVIO-CH2M HILL Constructors, Inc. Joint Venture III	Incorporate into site figures and discussion, as appropriate	None.

**20. Worksheet #14, Summary of Project Tasks, Section 14.2.1, Field Tasks, Page WS 14-3;**

**Procedure 3-12, Monitoring Well Installation, and Procedure 3-21, Surface and Subsurface Soil Sampling Procedures:** Worksheet #14 does not include sufficient information to complete the field work because the standard operating procedures in Appendix B (Resolution Consultants Standard Operating Procedures and Field Forms) are generic in nature. Site-specific details and criteria necessary to complete the field work must be included in Worksheet #14; it is not sufficient to rely on "professional judgment." For example, for monitoring well installation, the borehole diameter, well diameter, screen type, screen length, sand pack type, cement/bentonite grout mixture percentages, etc. are not specified and criteria for selecting these well completion requirements are not included in the SAP or Procedure 3-12 (Monitoring Well Installation) in Appendix B (Resolution Consultants Standard Operating Procedures and Field Forms). While some of these requirements are included in Worksheet #17 (Sampling Design and Rationale), this information should be presented in Worksheet #14 and justification for the sand pack, screen length, well diameter, and slot sizes is not provided. Other requirements, such as the percentage of cement and bentonite in grout, are not provided in the SAP. Similarly, a

detailed procedure and criteria for selecting soil and groundwater sample depths/intervals for submission to the analytical laboratory are not provided in the SAP or Procedure 3-21 (Surface and Subsurface Soil Sampling Procedures) of Appendix B (Resolution Consultants Standard Operating Procedures and Field Forms). In addition, the soil sampling procedure in Worksheet #14 should specify that soil samples will only be collected from fine-grained units (i.e., clays or clayey silts). Worksheet #14 should also specify that groundwater samples will only be collected from coarser units (i.e., sands or gravels). Revise Worksheet #14 to include detailed procedures, requirements, and criteria for completion of the field work, including, but not limited to, monitoring well construction specifications, groundwater sampling criteria, and soil sampling criteria.

**Response:** The SAP may be revised to address the details and criteria requested. The details and criteria will not be reiterated in all sections of the SAP. They will be listed in the sections that are most appropriate. Related sections will include cross references to direct the reader to the appropriate location for the details and criteria. Many of the criteria are to be decided based upon conditions discovered in the field and cannot be specified until well construction design is complete.

- 21. Worksheet #14, Section 14.4.4 Data Review Tasks, Page WS 14-5:** This section indicates 10% of the data will undergo a Level IV data validation and the remaining 90% will be validated as Level III, but does not discuss how the 10% of the data will be selected. Revise the text to discuss how 10% of the data to be validated at Level IV will be selected (e.g., randomly).

**Response:** Text will be revised to include the following information:

Resolution Consultants will validate 10% of the data at a level IV validation and the remaining 90% at a level III as outlined in WS#34-36. For each mobilization, the first 10% of the data submitted will undergo a level IV data review. If there are no gross errors associated with the data, then the remaining data will undergo level III validation. If gross errors are noted in the first 10% of the data validated, then level IV data validation will continue until the issues have been resolved.

- 22. Worksheet #16, Project/Timeline Table, Pages WS 16-1 to WS 16-2:** The schedule does not include validation of analytical results. Revise this worksheet to indicate when analytical data packages will be validated, and ensure that results will be validated before any decisions based on the data are made.

**Response:** The worksheet will be revised to include validation. Additionally, the following text will be added to the end of Section 14.4.4:

Results will be validated before any decisions based on the data are made.

- 23. Worksheet #17, Sampling Design and Rationale:** The sampling procedures and details included in Worksheet #17 (e.g., pages WS 17-5 and 17-6) are not rationale or sampling

design; these procedures should be moved to Worksheet #14 (Summary of Project Tasks). Revise the SAP to move sampling procedures to Worksheet #14.

**Response:** Procedural information in Worksheet #17 will be moved to Worksheet #14.

- 24. Worksheet #17, Sampling Design and Rationale, Section 17.1, Sampling Approach, Item 2, Page WS 17-1 and Section 17.3, Second Mobilization – Contingency Vertical Profile Borings, Page WS 17-7:** The purpose of the three contingency vertical profile borings as stated in Worksheet #17 is inconsistent with the purpose of these borings stated in Worksheet #11 (Project Quality Objectives/Systematic Planning Process Statements). Section 11.6 (Performance or Acceptance Criteria) of Worksheet #11 states that the purpose of the three contingency borings is “to determine the location and depth of the three monitoring wells,” but Worksheet #17 indicates that these borings are to address data gaps in general. Revise the SAP to resolve the inconsistency regarding the purpose of the three contingency borings.

**Response:** The SAP will be revised to indicate there are five contingency borings, and they will be used to fill data gaps identified during the execution of the field program.

- 25. Worksheet #17, Sampling Design and Rationale, Section 17.2.2.2, Vertical Profile Borings and Shallow Vadose Zone Borings, Page WS 17-4:** The bulleted statements that VP-15 and VP-16 and VP-22 through VP-27 will “assess the groundwater contaminant flow pathways to the extraction wells,” presents conditions that cannot be met given the work proposed in the SAP. Groundwater flow pathways cannot be assessed from lithologic logs, soil samples, and groundwater samples collected from borings; additional information such as the piezometric head, permeability, and transmissivity of each individual lithologic unit, hydraulic gradient, aquifer tests, and multiple tracer studies are typically required to evaluate groundwater flow pathways. To evaluate where TCE is being transported would also require a groundwater sample from each coarse-grained unit and microsampling in each fine-grained unit in each boring, but it is not clear that sufficient samples per boring will be collected to obtain these data. A similar statement is presented in the last sentence on page WS 17-4. Delete the quoted statement for locations VP-15 and VP-16, and VP-22 through VP-27, and the statement about assessing the flow pathways for TCE in groundwater in the last sentence on page 17-4, and provide a rationale for these locations or revise the SAP to include the detailed studies that are necessary to evaluate groundwater flow pathways.

**Response:** The SAP will be revised to indicate that the vertical profile borings VP-15 and VP-16 along with VP-22 through VP-27 will assist with the understanding the distribution of TCE in soil and groundwater at these locations. The data will be useful for evaluating flow pathways for TCE in groundwater from the source areas towards the extraction wells, which will be useful information for remedial evaluation and design. Further assessment of groundwater flow pathways is not part of this investigation.

- 26. Worksheet #17, Sampling Design and Rationale, Section 17.2.2, Vertical Profile Borings and Shallow Vadose Zone Borings, Page WS 17-5:** The text states that a PID may be used to evaluate areas targeted for sampling, but it is not clear that a PID would respond to

groundwater samples with low concentrations of VOCs. Note that soil samples will not be collected from the borings used for groundwater sampling and that it may not be possible to precisely locate thin intervals in these borings. An alternate method may be necessary. Revise the text to explain, in detail, how the PID will be used to select groundwater sample intervals or propose an alternate method for selecting groundwater sampling intervals.

**Response:** The SAP will be revised to provide more detail on the methodology and the criteria that will be used to select sampling intervals. Along with PID screening results, MIP results and lithologic data, (e.g. presence of coarse grained units, or contacts with fine grained units) will be used. It will be noted that frequent groundwater sampling (approximately at 5 foot intervals) coupled with PID screening will enable a detailed assessment of the groundwater profile in each boring.

**27. Worksheet #17, Sampling Design and Rationale, Section 17.2.2.2, Vertical Profile Borings and Shallow Vadose Zone Borings, Page WS 17-6:** The groundwater sampling procedures outlined on page 17-6 are not sufficient to minimize the potential for cross-contamination. For example, the temporary screen will not be decontaminated between sampling intervals unless it is pulled through a thick fine-grained unit; this can introduce cross-contamination. To minimize the potential for cross-contamination, groundwater samples should be collected from the water table downward and the drill string should be pulled so that the tooling and well screen can be decontaminated between each sample. Note that if this is done, the screen will not be exposed as the tool is pushed to the next sampling interval, so it will not be contaminated. Revise the groundwater sampling procedure to require sampling from the water table downward and decontamination of the tooling and temporary screen after each sample is collected.

**Response:** While the methodology offered by the EPA minimizes the potential for cross contamination, we have found that the methodology presented in the SAP provides a more efficient groundwater sampling program with sufficient quality for a screening assessment and remedial planning purposes. The groundwater data generated during this effort may result in a bias towards high concentration. However, we have found the methodology outlined in the SAP is more fiscally efficient. Given the 80 foot SOW depth and predominance of sandy media throughout the saturated vertical column, the Navy believes this sampling methodology with adequate purging techniques, is the most efficient means of obtaining samples to total depth, and produces data of sufficient quality to select and design a source area remedy. In addition, this sampling methodology has been successfully used by AECOM/Resolution Consultants and accepted for use by EPA at other Superfund sites, with a few examples listed below:

- EPA Region 5 (Nabil Fayoumi), Rose Township Superfund site, Holly, MI
- Independent Landfill in Muskegon, MI (De-listed NPL site)
- EPA region 1, UTC, Windsor Locks, CT
- TCE Voluntary state lead sites in Indiana, New Hampshire, Michigan, Wisconsin, etc.

However, based on EPA and MPCA concerns, the Navy will consider using the “bottom down” sampling approach with decontamination of the screen between each sampling depth

in soil borings near the East Plating Room. This decision will be made by the field crew based upon the MIP responses, thickness and frequency of fine grained soil units encountered, and the drilling conditions encountered vs. drilling depths achievable.

- 28. Worksheet #17, Sampling Design and Rationale, Section 17.5, Fourth Mobilization – Groundwater Sampling, Page WS 17-9:** The text states that “Sampling Equipment will be decontaminated between monitoring well locations,” but some equipment should be discarded (e.g., single use bailers should be required, drop tubing for sampling should be discarded because it cannot be decontaminated, etc.). Also, it is unclear if a bladder pump will be installed in each well or if a single pump will be removed and decontaminated between wells. Revise the text to specify the equipment that will be decontaminated and reused, and the equipment that will be discarded after each well is sampled.

**Response:** The SAP will be revised to note that tubing used during well purging and sampling will be discarded between sample locations. The SAP will also note that non-disposable equipment used during sampling (e.g. the bladder pump) will be decontaminated between sampling locations.

- 29. Worksheet #18, Location-Specific Sampling Methods/SOP Requirements Table:** The Location-Specific Sampling Methods/SOP Requirements Table is missing the column “Rationale for Sampling Location,” per page 22 of the UFP-QAPP Workbook. The rationale related to the study goals and data needs for the project for each sampling location should be provided. Revise Worksheet #18 to include the rationale for each sampling location and relate this rationale to the study goals and data needs for the project.

**Response:** The referenced column will be added to Worksheet #18.

- 30. Worksheet #19, Analytical Methods/SOP Requirements Table, Page WS 19-1:** Worksheet #19 indicates that soil samples for VOC analyses will be collected using one glass container with a methanol preservative, but Encore<sup>®</sup> samplers are preferred for VOC sampling. Revise this worksheet to utilize Encore<sup>®</sup> samplers or, alternatively, ensure the SAP is consistent with the SOP 3-21 in Appendix B which indicates that each sample for VOC analyses will be collected using three 40 milliliter (mL) vials with preservatives for low level and high level concentrations.

- 31. Response:** Both the Encore samplers and low level vials cited in SOP 3-21 are for the analysis of low level VOCs. Soil samples collected for this project will be collected in methanol only and the reporting limits on Worksheet #15 will be achieved. Low level soil VOCs are not being analyzed (e.g. not the project goal) so low level sampling procedures are not necessary. Vadose zone samples, however (where proposed), will be collected using three 40 milliliter (mL) vials with preservatives for low level and high level concentrations.

A note will be added to Worksheet #21 that states procedures in the SAP take precedence over the procedures in the SOPs, if contradictions are observed.

**32. Worksheet #21, Project Sampling SOP References Table, Page WS 21-2:** The SOP Reference Number and revision information for the Geoprobe<sup>®</sup> Screen Point 16 Groundwater Sampler and Membrane Interface Probe SOP are not consistent with the SOP provided in Appendix D. The SOP in Appendix D is indicated to be Technical Bulletin No. MK3142, prepared November 2006. However, Worksheet #21 lists Technical Bulletin No. MK3137MK3010 and presents conflicting revision information (e.g., “Revision 0, March 2007” and “Prepared May 2003, Revised June 2009”). Revise the SAP to resolve these discrepancies.

**Response:** The SAP will be revised to address these discrepancies.

**33. Worksheet #22, Field Equipment Calibration, Maintenance, Testing, and Inspection Table, Page WS 22-1:** This worksheet indicates that acceptance criteria for the MIP are provided by the manufacturers’ guidance. However, the Manufacturer’s Guidance Manuals are not provided for any instrument. In addition, the subcontractor’s SOP in Appendix D for the MIP are not referenced by Worksheet #22. Revise this worksheet to include manufacturer’s manuals and to reference the MIP SOP.

**Response:** The SAP will be revised to include the manufactures guidance manuals and the SOP for MIP operations.

**34. Worksheet #24, Analytical Instrument Calibration Table, Pages WS 24-1 to WS 24-2:** This table is missing the tuning requirements for analyses by Method 8260B and the interference check solution for Method 6010C. Revise Worksheet #24 to include these calibration procedures.

**Response:** The requested information will be added.

**35. Worksheet #25, Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table, Page WS 25-1:** This table indicates inductively coupled plasma (ICP)-mass spectrometry will be used, but the proposed analytical method (Method 6010C) utilizes ICP-atomic emission spectrometry. Revise this table to resolve this discrepancy

**Response:** The table will be revised.

**36. Worksheet #28, Laboratory QC Samples Table, Page WS 28-2:** This table indicates that a post digest spike (PDS) will be performed when a serial dilution fails or all analyte concentrations are less than 50 times the LOD, and the acceptance criteria for the PDS recovery are 75 to 125%. However, the table does not indicate that the PDS will be performed when a matrix spike does not meet acceptance criteria. Method 6010C indicates that a PDS should be performed when MS/MSD recoveries are unacceptable, and the acceptance criteria for the PDS should be 80 to 120%. Revise this table to indicate that a PDS will also be analyzed whenever MS/MSDs do not meet acceptance limits, and to identify the percent recovery acceptance limits for the PDS as 80 to 120%.

**Response:** Table will be revised.

**37. Worksheet #31, Planned Project Assessments Table, Page WS 31-1:** This table does not include an audit of the laboratory performing the analyses for this investigation. It is recommended that audits are conducted to ensure the laboratory can produce data of sufficient quality. In addition, audit checklists for the planned assessments are not provided or referenced. Revise the SAP to include a laboratory audit or to provide justification for the lack of laboratory audits if they will not be conducted. Also, revise the SAP to provide audit checklists indicating the items to be evaluated for the planned assessments.

**Response:** The laboratory is DoD ELAP accredited and is audited biennially by a DoD ELAP accreditation auditor. Therefore, Resolution Consultants will not be performing a laboratory audit. The laboratory is audited for compliance to the DoD Quality Systems Manual (current version being 4.2).

**38. Worksheets #34-36, Data Verification and Validation Process Table, Pages WS 34 – 36-3:** In Data Review Input step “Validation Groundwater and Soil VOCs”, it states what worksheets and guidance documents would potentially be used for validation of data, including the *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (2008)*. The National Functional Guidelines (NFG) are indicated to be utilized to apply qualifiers to the data “to the extent possible”. What is the protocol to be followed if the NFG cannot be properly utilized to qualify the data, and how would this be applied instead of the NFG? Please specify.

**Response:** Text will be restated as follows:

USEPA’s Contract Laboratory Program National Functional Guidelines for Superfund Organics Methods Data Review (2008) (NFG) will be used for the general approach in applying qualifiers. However, qualifiers will be assigned when control limits identified in this SAP are exceeded rather than using the NFG control limits.

**39. Worksheets #34-36, Data Verification and Validation (Steps I and IIa/IIb) Process Table, Pages WS 34 – 36-3:** This table indicates that the criteria to be used for validation of the VOC data include Method 8260B specific criteria, data quality indicators in the Department of Defense Quality Systems Manual (QSM), and the criteria presented in Worksheets #12, #19, and #28 of this SAP. Since multiple criteria are referenced for the data validation procedures, data validation checklists describing how samples will be qualified (e.g., when samples will be qualified estimated/rejected) should be provided for each analytical method. Revise the SAP to provide data validation checklists.

**Response:** Data validation checklists will be provided.

**40. Worksheet #37, Usability Assessment, Pages WS 37-1 to WS 37-3:** This worksheet does not indicate that overall trends to the data will be evaluated and discussed in the Data Quality Assessment (DQA) that is included in the project report. The DQA should include a detailed description of how the items in Worksheet #37 were evaluated with sufficient information to

support the data usability conclusions. Revise the SAP to indicate that the DQA included in the project report will include this information.

**Response:** The first paragraph of Worksheet #37 will be revised as follows:

The usability of the data directly affects whether project objectives can be achieved. The following characteristics will be evaluated at a minimum. The results of these evaluations will be included in the Chemical Data Quality Review Report which will be appended to the final project report. Overall trends if any that may be associated with the data will be evaluated and discussed in the Chemical Data Quality Review Report.

- 41. Worksheet #37, Usability Assessment, Pages WS 37-1:** Completeness is discussed in this worksheet, but field and laboratory completeness goals are not established. Revise this worksheet to provide completeness goals for the project.

**Response:** The following text will be added after the completeness calculation:

The completeness goal for samples received at the laboratory for this project is 95%.

The completeness goal for the collection of planned field samples is 80%. It is considered possible that site conditions will prevent the collection of all samples, particularly samples at greater depths.

- 42. Worksheet #37, Usability Assessment, Page WS 37-3:** This worksheet states that there may be reason to use rejected data in a weight of evidence argument, especially when the rejected data supplements data that have not been rejected. However, rejected data are not quantifiable and should not be used for decision making. Revise the SAP to indicate that rejected data will not be used for making decisions.

**Response:** The last line of this section has been revised as follows:

Rejected data will not be used for making decisions.

- 43. Appendix B, Resolution Consultants Field Standard Operating Procedures and Field Forms, Procedure 3-02 (Logbooks), Page 3 of 5:** The SOP for logbooks does not include a procedure to address unused space in the logbooks. For example, the SOP does not indicate that a single diagonal line should be drawn through blank or unused portions of the pages, then initialed and dated. Revise the Logbooks SOP to include a procedure to address the unused space in a logbook.

**Response:** The SAP will be revised to indicate a signed and dated diagonal line will be drawn through unused portions of pages of the daily field log.

- 44. Appendix B, Resolution Consultants Field Standard Operating Procedures and Field Forms, Procedure 3-04 (Sample Handling, Storage, and Shipping), Page 2 of 15:** The SOP does not require sufficient headspace (ullage) in all bottles (except VOA containers) to

compensate for changes in pressure and temperature during shipping (approximately 10 percent of the container volume). Revise the SOP to include this requirement to ensure the sampling containers are not impacted by changes in pressure and temperature during shipping.

**Response:** The SAP will be revised to indicate approximately 10 percent head space shall be left in non-VOC sample containers.

- 45. Appendix B, Resolution Consultants Standard Operating Procedures and Field Forms, Procedure 3-14 (Monitoring Well Sampling), Section 8.2.7 (Sample Handling and Preservation), Page 11 of 15:** The sampling procedure does not specify that if bubbles are detected in a volatile organic analyte (VOA) vial, the vial should be discarded and a new pre-preserved VOA vial should be used to collect the VOC sample. It is not acceptable to open and refill VOA vials because VOCs could be lost and preservative may be diluted. If after several attempts, a bubble-free sample cannot be collected, the VOC sample should be collected in an unpreserved VOA vial. Note that this may change the holding time for this sample. Revise Procedure 3-14 to specify that VOA vials must be discarded if bubbles are observed in the sample and a new preserved VOA vial be used to collect the sample. In addition, revise the procedure to address the condition where bubbles are observed in a VOA vial after several attempts have been made to collect the sample (i.e., using an unpreserved VOA vial), including revising the SAP to include the holding time for unpreserved VOA samples.

**Response:** The SAP will be revised to indicate that if bubbles are observed in aqueous VOC sample containers, the container will be discarded and a new container used for the laboratory sample. If bubbles are observed in a VOA vial after several attempts have been made to collect the sample, then an unpreserved VOA vial will be used. The holding time for unpreserved VOA samples will be added to the SAP.

## MINOR COMMENTS

- 1. Worksheet #4, Project Personnel Sign-Off Sheet, Page WS 4-1:** The telephone number listed in this worksheet for the Field Operations Leader and Site Safety Officer Dan Phelps is different than the number listed in Worksheets #3 (Distribution List), #5 (Project Organizational Chart), and #7 (Personnel Responsibilities Table). Revise the SAP to resolve this discrepancy and/or clarify the difference between the numbers.

**Response:** Phone number will be corrected.

- 2. Worksheet #17, Sampling Design and Rationale, Section 17.2.2.2, Vertical Profile Borings and Shallow Vadose Zone Borings, Page WS 17-6:** The word “aquitarde” should not be used to describe fine-grained units regardless of thickness. Aquitards have specific properties (e.g., very low permeability and transmissivity, lack of root holes and other high permeability features, lateral continuity and extent, etc.), so the word “aquitarde” should not be used unless it can be demonstrated that the specific lithologic unit meets all of the criteria

for an aquitard. It is recommended that the word “unit” be used. Delete the word aquitard from Worksheet #17 and replace it with a less specific word unless it can be demonstrated that the specific unit meets the criteria for an aquitard. Also, revise the SAP to delete all occurrences of the word “aquitard.”

**Response:** The SAP will be revised to eliminate the use of the term aquitard. More generic descriptions, (e.g. fine grained soil unit) will be used throughout the document.

- 3. Worksheet #24, Analytical Instrument Calibration Table, Page WS 24-1:** The acceptance criterion for the relative retention time (RRT) evaluation is for the RRT of each target analyte to be within 0.006 RRT units, but Method 8260B, Section 7.3.7, Evaluation of Retention Times, indicates this should be within 0.06 RRT units. Revise this table to identify the RRT evaluation acceptance criterion as target analytes within

**Response:** Worksheet corrected to within  $\pm 0.06$  RRT units.