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LETTER AND ATTACHED RESPONSE TO THE U S EPA REGION V COMMENTS ON THE TECHNICAL MEMORANDUM FOR SOIL DELINEATION SAMPLING AT (SWMU 3) AMMUNITION BURNING GROUNDS/OLD JEEP TRAIL NSA CRANE IN
05/16/2014
TETRA TECH INC

TETRA TECH

PITT-05-14-049

May 16, 2014

Project No. 112G01819

Mr. Howard Hickey
NAVFAC MW
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, Illinois 60088

Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order No. C065

Subject: ***Final*** Technical Memorandum SWMU 3 Soil Delineation Sampling Data Summary

Dear Mr. Hickey:

Enclosed is a hardcopy and CD of the Final version of the Technical Memorandum of the contaminant delineation work conducted to date at the Old Jeep Trail. EPA comments dated December 4, 2013 and April 15, 2014 have been addressed. Response to these comments are attached.

Please contact me at (412) 921-8308 (email: Ralph.Basinski@tetratech.com) regarding any questions or comments.

Sincerely,

Ralph R. Basinski
NSA Activity Coordinator

RRB/mlg
Enclosure/Attachment

cc: Mr. Tom Brent, NSA Crane (letter/attachment/4 enclosures/4 CDs)
Mr. Ralph Basinski, Tetra Tech (letter/attachment/enclosure/CD)
Mr. John Trepanowski, P.E., Tetra Tech (letter)
Ms. Karen Lyons, Tetra Tech (letter)
Mr. Jim Goerdt, Tetra Tech (letter/attachment/enclosure)
Mr. Jim Coffman, Tetra Tech (letter/attachment/enclosure)
Regional Database Manager (letter/attachment/enclosure/CD)
Project File – CTO C065 (letter/attachment/enclosure/CD)

Tetra Tech, Inc.
661 Andersen Drive, Pittsburgh, PA 15220-2700
Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

RESPONSES TO EPA COMMENTS RECEIVED APRIL 15, 2014
(ORIGINAL COMMENTS RECEIVED DECEMBER 4, 2013)

TECHNICAL MEMORANDUM FOR SOIL DELINEATION SAMPLING AT SWMU 3
(AMMUNITION BURNING GROUNDS/OLD JEEP TRAIL)
NSA CRANE

General Comment 1: **You need to be clear on how the excavation limits to known clean points in the vertical and horizontal for the floor and lateral limits of the anticipated excavations will be defined by this sampling. This additional delineation sampling event should ensure that vertical delineation is defined by a clean sample point below the anticipated excavation depth and lateral delineation is defined by clean sample points at the limits of the proposed excavation at the +/- 5 foot and +/- 10 foot horizontal intervals. Using the hot spot 03SB018 delineation as an example, that location identified elevated lead at the 2-4 foot interval. 3SB018S2 is identified as a clean bounding sample point, yet there is no FBL sample and the sampled interval is only at the 2-4 foot depth. If the Navy is proposing to use such a point to represent a clean point for excavation purposes as shown on the revised Figure 4-1, that point must have a FBL result < MCS and the sample interval below that proposed for excavation should also be shown by FBL analysis to be clean. Thus, if the Navy were to excavate the 03SB018 hotspot to 4 feet, in the absence of post-excavation confirmation sampling there needs to be a clean FBL sample at the 4-6 foot depth interval at point 03SB018S2. In looking at Figure 4-1, it seems as if the figures and proposed additional sampling locations may need to be re-evaluated. Please also re-evaluate the need for additional delineation sampling around 03SB019 to ensure you can show a 3 dimensional clean boundary surrounding the hotspot and re-assess the existing samples you are proposing to use as "clean" boundary samples around 03SB022 and 03SB024 (Figure 4-3) to determine whether additional sampling is needed to ensure you have a clean FBL based sample at the proper depths to act as your verifications samples at the perimeter and floor of the anticipated excavation.**

General Comment Response: Additional depth intervals are proposed at sample locations representing excavation limits to ensure lower depth is clean. For example, if excavating down to 4 feet bgs at sample location X, a 4 to 6 foot sample would be required at this location to ensure "clean" point below.

For current excavation boundaries around "hot spots" 03SB018, 03SB018E2, and 03SB018N2 additional samples at the 4 to 6 foot interval will be collected at:

- 03SB018N3
- 03SB129
- 03SB018E3
- 03SB018S2
- 03SB018S1

The following three newly proposed locations will also be sampled at 2 to 4 and 4 to 6 feet bgs:

- 03SB165
- 03SB166
- 03SB167

For current excavation boundaries around 03SB019, additional samples at the 4 to 6 foot interval will be collected at:

- 03SB019N2

- 03SB019W1
- 03SB019S1
- 03SB019E1

The following newly proposed location will also be sampled at 2 to 4 and 4 to 6 feet bgs:
- 03SB168

For current excavation boundaries around 03SB048, additional samples down to 10 feet bgs will be collected at:
- 03SB048N1
- 03SB048W1
- 03SB048S1
- 03SB048E1

The following two newly proposed locations will also be sampled down to 10 feet bgs:
- 03SB169
- 03SB170

The RDX/TNT contamination around sample locations 03SB022 and 024 varies from 2 feet bgs down to 4 feet bgs. The two original hot spots (03SB022 and 03SB014) indicate that contamination is bounded at 4 feet bgs. All of the samples collected during the Round 2 field event were collected at a maximum depth of 4 feet bgs, with many of those samples exhibiting contamination at the 2 to 4 foot depth. Since there is no indication from these samples that the 4 to 6 foot depth interval is "clean", several of the locations will be re-evaluated at the 4 to 6 foot depth to confirm the contamination does not exist below the 4 foot depth throughout the area. All of the newly proposed samples in this area are for 0 to 2, 2 to 4, 4 to 6, 6 to 8, and 8 to 10 feet bgs, with the 6 to 8, and 8 to 10 foot intervals marked to be held at the laboratory and only analyzed upon instruction by Tetra Tech to do so.

Table 4-1 has been updated to reflect the new sample rationales.

Comment 1: Referring to Response to Comment 1 (Section 1), the response indicates a new "hot spot" was detected to the east by 03SB018E3; however, I am assuming the response meant to say 03SB018E2.

Comment 1 Response: Correct, the new "hot spot" should be identified as 03SB018E2, as location 03SB018E3 was a clean sample. Additionally, sample location 03SB018N2 had an XRF lead reading of 1,400 ppm. This location was not previously marked as a "hot spot", but has now been added and additional samples are proposed around this location to delineate the area both laterally and vertically.

Comment 2: The last paragraph of Response to Comment 1 (Section 2) states that additional step-out locations were not always practical to implement in the field, why could those samples not have been relocated during that sampling effort as stated earlier in the response? Rather than remobilizing for a 3rd field sampling effort, how does TetraTech propose to deal with field issues in this sampling event should the original planned locations not be accessible or were these proposed locations already field located for accessibility?

Comment 2 Response: All proposed sample locations have been land surveyed; however, a few of the proposed locations are still inaccessible at this time due to the storage of large metal crates, etc. at the

site. Prior to mobilizing to the field for this round of sampling, Tetra Tech will request that the Navy remove the items so the sampling objectives can be met.

RESPONSES TO EPA COMMENT RECEIVED DECEMBER 4, 2013

TECHNICAL MEMORANDUM FOR SOIL DELINEATION SAMPLING AT SWMU 3 (AMMUNITION BURNING GROUNDS/OLD JEEP TRAIL)

NSA CRANE

Comment 1: Boring 03SB018 Area: Section 3.1 as written seems to indicate that full horizontal and vertical delineation around this boring is complete, yet Section 4.1 goes on to propose additional delineation sampling associated with the 03SB018 Area effort. It is unclear from the Tech Memo that the November 2011 SAP was adhered to when performing the delineation around 03SB018. Section 7.1 of the SAP discusses the objective to complete full vertical and horizontal delineation including the XRF analysis at all 2 foot depth intervals down to 10 feet or bedrock if shallower and step-in/step-out sampling until perimeter hot/cold spots are 5 feet apart whereupon the perimeter samples showing < 200 ppm XRF would be sent for FBL analysis. From the Tech Memo, it does not seem that this SAP was followed (e.g. subsurface soil samples collected from 2 to 8 feet only). Was there refusal at 03SB018S2 at 4 feet, for example? The Tech Memo should explain any variances from the 2011 SAP, why things were changed, and how the proposed sampling will achieve the delineation plan approved in the 2011 SAP (full, three dimensional bounding with known FBL samples < MCS).

Comment Response: Based on the complexity of the comment regarding the May 2013 Tech Memo, the comment has been broken down into sections and each section is individually addressed below:

Comment 1 (Section 1): Boring 03SB018 Area: Section 3.1 as written seems to indicate that full horizontal and vertical delineation around this boring is complete, yet Section 4.1 goes on to propose additional delineation sampling associated with the 03SB018 Area effort.

Comment Response: Section 3.1 of the May 2013 Technical Memorandum was incorrect when stating that the area around original "hot spot" 03SB018 had been fully delineated both vertically and horizontally. Original "hot spot" sample location 03SB018 and the surrounding area was delineated vertically at a depth of four feet where the lead concentrations were all below the screening criteria at the 4- to 6-ft bgs sample interval at several surrounding locations. However, based on sample location 03SB018E2-0204 having a lead concentration greater than the screening criteria at the 2- to 4-ft depth interval, the area to the northeast of original "hot spot" location 03SB018 has not been completely delineated laterally.

Additional sampling is required to fully delineate the area, as proposed in the Technical Memorandum.

Based on this information, the text within the second paragraph of Section 3.1 has been revised to read as follows:

"Figure 3-1 presents the sample locations with lead concentrations greater than (red dots) and less than (green dots) MCSs for the subsurface soil data in the area of location 03SB018. The data results show that the lead contamination present at "hot spot" location 03SB18 has been delineated vertically to a depth of 4 feet bgs as determined by the clean samples collected from the 4 to 6 foot bgs interval in the area. Additionally, "hot spot" location 03SB018 has been delineated horizontally to the north by

03SB018N2 (15 feet away), to the south by 03SB018S2 (6 feet away), and to the west by 03SB018S1 (6 feet away); however, a new "hot spot" was detected to the east by 03SB018E3 (15 feet away).

Additionally, Figure 3-1 has been updated to incorporate all of the lead data so the reader can easily visualize the site regarding detected lead concentrations. Figure 3-1 is included as an attachment to these Responses to Comments.

Comment 1 (Section 2): Section 7.1 of the SAP discusses the objective to complete full vertical and horizontal delineation including the XRF analysis at all 2 foot depth intervals down to 10 feet or bedrock if shallower and step-in/step-out sampling until perimeter hot/cold spots are 5 feet apart whereupon the perimeter samples showing < 200 ppm XRF would be sent for FBL analysis.

Comment Response: The SAP indicates that delineation samples (step-outs) would initially be positioned 20 feet from the original "hot spot" sample locations for the four major compass directions (north, south, east, and west). A sample was then to be collected from the selected initial depth interval and field analyzed for lead with the XRF. The XRF lead concentration from the initial selected depth was then used to determine if additional sample depths and additional step-out samples were required. If the XRF lead concentration was below the field screening criteria of 200 ppm, then that particular location was deemed delineated vertically and horizontally and no additional sampling would be required at that particular location, nor would additional step-out samples be required. A step-in sample would then be positioned and collected to further delineate the area closer to the original "hot spot". This activity was completed in accordance with the SAP. It should be noted that since SWMU 3 is identified as a site that may potentially contain UXO each step-out sample location underwent anomaly screening with a magnetometer prior to intrusive sampling. Due to many of the step-out sample locations being located within the gravel area of the site which contains high amounts of metallic debris, the step-out locations were continually being field revised in various directions from the original planned step-out locations due to "hits" on the metal detector. This continual re-positioning of the sample locations made it impossible to lay out the step-out samples in straight directional lines as presented in the SAP. Due to the repositioning of the step-out/step-in sample locations, the distances between the original "hot spot" location and the next outer clean sample ranged anywhere from 5 to 15 feet.

Worksheet No. 7 of the SAP states the overall goal of the sampling strategy "is to establish horizontal and vertical extents of contamination for residential receptors while optimizing sample collection and laboratory analyses to establish an area of contamination within $\pm$ 5 feet horizontally for lead...". The overall sampling strategy is relatively complex. Its goal was to establish horizontal and vertical extents of contamination for residential receptors while optimizing sample collection and laboratory analyses to establish an area of contamination within ±5 feet horizontally for lead, within ±10 feet horizontally for TNT and RDX, and within nominal vertical intervals. Nominal vertical sampling intervals are 0 to 2, 2 to 4, 4 to 6, 6 to 8, and 8 to 10 feet bgs with a maximum depth of 10 feet bgs established by residential receptor exposure potential. During the field sampling event, vertical delineation at a particular sample location continued at the nominal sampling intervals until it was determined that the lead contamination had been bounded. For example, at location 03SB018S2, sampling was discontinued at the 2 to 4 foot depth since that particular sample had a lead concentration well below the screening criteria and lead contamination was not expected at depths greater than 4 feet bgs. Only three locations within the entire site exhibited lead concentrations above the 400 mg/kg screening criteria. Additional samples were then collected at the 4 to 6 foot depth interval at these locations where all

three exhibited very low lead concentrations indicating the lead contamination at the site is indeed confined to depths less than 4 feet bgs.

In regards to the lead contamination around "hot spots" SB018 and SB019, if the lead concentration of a particular step-out sample was above the XRF field screening criteria of 200 ppm, then this location was then to be treated as a **new** "hot spot" and according to the SAP, four new locations were to be laid out at 20' in all four directions. Although the SAP indicated that additional step-out locations would be required for locations exhibiting an XRF lead concentration greater than 200 ppm, this was not always practical to implement in the field. Although the SAP could not be precisely implemented in the field, the main objective of this delineation sampling event was accomplished in most instances, which was to define the outer boundaries of contamination. The intent of the Technical Memorandum is to collect additional samples in those areas that were not completely delineated during the 2011 field effort.

Comment 1 (Section 3): From the Tech Memo, it does not seem that this SAP was followed (e.g. subsurface soil samples collected from 2 to 8 feet only). Was there refusal at 03SB018S2 at 4 feet, for example?

Comment Response: Executive Summary Paragraph 5 states the following: "The investigation strategy for SWMU 3 is to implement soil contamination delineation sampling (lead, RDX and TNT) for an Interim Measure Work Plan (IMWP) phase of the project at five discrete "hot spot" areas in order to provide soil excavation design data. The IMWP will include the volume of soil required for excavation in order to achieve the Media Cleanup Standard (MCS), which is based on the horizontal and vertical extent of soil contamination. Based on this approach, no confirmation sampling will be required after excavation."

Section 7.0 of the SAP states the following. "The overall sampling strategy is relatively complex. Its goal is to establish horizontal and vertical extents of contamination for residential receptors while optimizing sample collection and laboratory analyses to establish an area of contamination within ±5 feet horizontally for lead, and within ±10 feet horizontally for TNT and RDX, and within nominal vertical intervals. Nominal vertical sampling intervals are 0 to 2, 2 to 4, 4 to 6, 6 to 8, and 8 to 10 feet bgs with a maximum depth of 10 feet bgs established by residential receptor exposure potential."

As noted in the Executive Summary, the delineation data will be used in the IMWP to provide excavation data and that no confirmation sampling would be required. USEPA Region 5 requires that excavation boundaries be set at clean sample locations if confirmation sampling is not to be required. Establishing excavation boundaries based on RFI data only would result in the excavation of large quantities of soil. The overall objective of the delineation sampling is to collect additional data to allow establishment of refined excavation boundaries, which would result in the excavation of smaller quantities of soil. The sampling strategy identified in the SAP was designed to provide a framework to meet this objective.

The majority of the December 2011 field sampling event did accomplish the main objective of the SAP which was to further delineate the site in regard to lead, TNT, and RDX contamination. Although the vertical extent of contamination has been determined, the detailed evaluation of XRF/FBL analytical data indicates that some minor data gaps still exist as far as the ±5 foot (lead) and ±10 foot (RDX/TNT) horizontal delineation is concerned. The additional sampling proposed in the revised Tech Memo has

been specifically developed to address those potential delineation deficiencies for SWMU 3 soil contamination.

As previously mentioned, and as normal protocol when delineating soil contamination at NSA Crane sites, contamination is defined as bounded upon reaching a "clean" soil depth interval. In the example of 03SB018S2, additional depth intervals greater than 4 feet bgs were not sampled due to the 2- to 4-ft depth interval exhibiting an XRF lead concentration of 58 ppm, which was well below the field screening criteria of 200 ppm.

Only six locations within the entire site exhibited lead concentrations above the 200 mg/kg screening criteria. Additional samples were then collected at the 4 to 6 foot depth interval at these locations where all six exhibited very low lead concentrations indicating the lead contamination at the site is indeed confined to depths less than 4 feet bgs. Therefore, additional sampling down to 10 feet bgs or bedrock was not warranted.

Comment 1 (Section 3): The Tech Memo should explain any variances from the 2011 SAP, why things were changed, and how the proposed sampling will achieve the delineation plan approved in the 2011 SAP (full, three dimensional bounding with known FBL samples < MCS).

Comment Response: The Tech Memo has been revised as necessary to explain any variances from the 2011 SAP. Additionally, Section 4.0 of the Tech Memo has been reviewed and updated as necessary to ensure the contamination has been fully delineated within the approximate ±5 foot (lead) and ±10 foot (RDX/TNT) horizontal intervals. Table 4-1 of the Tech Memo has been revised to include a rationale column for the proposed samples. Additionally, Table 4-1 has been revised in that the majority of proposed lead analyses for the samples located in the areas of the RDX and TNT contamination (Figure 4-3 "hot spots" 03SB022 and 03SB024) have been removed. The rationale for removing the initially proposed lead analyses is that based on the analytical results from the 2011 sampling event, lead is not a contaminant of concern in this area. The exception to this is the area south of sample location 03SB024. The lead contamination associated with this location has not been fully bounded to the south; therefore, lead analysis will remain for proposed step-out samples 03SB183 and 03SB184. A copy of revised Table 4-1 is included as an attachment to these Responses to Comments.

Due to the expectation that lead contamination was co-located with the RDX and TNT contamination around "hot spots" SB022 and SB024, the lead XRF concentration in the associated step-out samples was the field driver in determining if the "hot spot" had been delineated vertically and horizontally. A footnote in Table 8.1 of the SAP indicates that the "XRF analysis will be a field determination based on the step-out criteria presented in Worksheet No. 7". If this had not been done, the total number of samples that would have been required from every node at every depth interval down to 10 feet bgs would have been extremely high and the sampling effort could not have been completed in a single field effort, which was one of the objectives listed in the SAP. However, by taking this approach, the areas around SB018, SB022, and SB024 were not fully delineated for RDX and TNT. Additional sampling is required to delineate these areas and the efforts to do this are included in the revised Tech Memo.

A summary table (Table 1) has been included as part of these Responses to Comments. This table is SAP Table 8-1 with two columns added. The first column labeled "Collected (Yes or No)" states whether the sample was collected. The second column labeled "Rationale" states the reason why the sample was collected or was not collected.

Figures 4-1, 4-2, and 4-3 of the Tech Memo have been revised to reposition proposed sample locations so the distances between sample locations is now consistent with the approximate ±5 foot (lead) and ±10 foot (RDX/TNT) horizontal intervals as stated in the SAP. Figures 4-1, 4-2, and 4-3 are included as attachments to these Responses to Comments. The rationale for all proposed samples is presented on the attached Table 4-1.