AECOM
257 West Genesee St.
Buffalo, NY 14202

716-856-5636 tel

March 31, 2017

Submitted via Courier and E-mail:

Mr. Harry Warner, P.E.
Regional Hazardous Waste Engineer
NYSDEC Region 7
Division of Environmental Remediation
615 Erie Blvd. West
Syracuse, New York 13204-2400

Subject: UTC/Carrier Corporation Thompson Road Site
NYSDEC Site Registry #734043
Sanders Creek Supplemental Sampling and Analysis Report

Dear Mr. Warner,

On behalf of United Technologies Corporation (UTC), AECOM Technical Services, Inc. (AECOM) is hereby submitting the Sanders Creek Supplemental Sampling and Analysis Report dated March 2016.

Yours sincerely,

Robert E. Murphy, PE
Project Manager

Robert.E.Murphy@AECOM.com

cc: Michael Belveg, NYSDEC (hard copy)
Mary Jo Crantz, NYSDEC (hard copy)
Julia M. Kenney, NYSDOH (hard copy)
Garry Priscott, NYSDEC
John Wolski, UTC
Joe Basile, Carrier
Kathleen McFadden, UTC

Prepared For:
United Technologies Corporation
Shared Remediation Services
Farmington, CT

Prepared by:
AECOM
Buffalo, NY
60438251

March 2017

SANDERS CREEK

UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY

Supplemental Sampling and Analysis Report

Corrective Action Order - Index CO 7-20051118-4

NYSDEC Site Registry #734043

Prepared For:
United Technologies Corporation
Shared Remediation Services
Farmington, CT

Prepared by:
AECOM
Buffalo, NY
60438251

March 2017

SANDERS CREEK
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY

Supplemental Sampling and Analysis Report

Corrective Action Order - Index CO 7-20051118-4
NYSDEC Site Registry #734043

Prepared for:

United Technologies

UTC Shared Remediation Services
9 Farm Springs Road
Farmington, Connecticut 06032

Prepared By:

AECOM USA, Inc.
257 West Genesee Street, Suite 400
Buffalo, New York 14202

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

AECOM, USA, Inc. (AECOM) is providing professional services to United Technologies Corporation (UTC), at the Carrier Thompson Road Campus in Syracuse, New York (Facility). The work is being performed under the requirements of an Order on Consent (CO) between UTC and New York State Department of Environmental Conservation (NYSDEC) dated January 2006. The CO requires UTC/Carrier, in part, to investigate facility releases of polychlorinated biphenyls (PCBs) to Sanders Creek to determine the nature and extent of PCB contamination. The area of investigation (Site) is the portion of Sanders Creek beginning just east of Kinne Street and continuing downstream (west) to the confluence with South Branch of Ley Creek.

Following AECOM's approved January 2016 Sampling and Analysis Plan (SAP), AECOM performed the Site investigation in April/May 2016. The results of the investigation were submitted to the NYSDEC in AECOM's Sampling and Analysis Report (SAR) dated August 2016. The findings were discussed in a November 2, 2016 meeting between NYSDEC, UTC and AECOM. At the meeting, AECOM presented a Conceptual Site Model (CSM) based on the SAR, and proposed sediment and soil remediation objectives.

It was agreed at the November 2, 2016 meeting that supplemental sampling would be performed. In response, AECOM prepared a Supplemental Sampling and Analysis Plan (SSAP), dated November 11, 2016, and following NYSDEC approval of the SSAP, conducted the supplemental sampling in December 2016.

1.1 Investigation Objectives

The specific data objectives of the supplemental sampling were to:

- Perform additional sampling to provide PCB data at boring depths of 2 feet (ft) to 4 ft and
- Bound the horizontal and vertical limits of the one location reported in the SAR (4810-SB-N) where detection of PCB's exceeded 50,000 micrograms per kilogram (ug/kg).

This Supplemental Sampling and Analysis Report (SSAR) presents the findings of the investigation, and evaluates whether or not the data supports the CSM and proposed sediment and soil remediation objectives.

2.0 Site Background

This section provides a description of the Site and nearby area.

2.1 Site Description

The Site is located in the Town of DeWitt, Onondaga County, New York, approximately 1 mile south of the New York State Thruway. Sanders Creek flows westward for approximately 8,900 ft from New Venture Gear Drive northeast of the Carrier Facility to the confluence with South Branch of Ley Creek just east of Ridings Road. The only tributaries to Sanders Creek in the immediate Site area are the Kinne Street ditch, located on the eastern side of the Facility, and an outlet channel from a pond located on Carrier property just east of Old Court Street , near the intersection with NYS Route 298.

The Facility occupies approximately 175 acres, much of which is either paved, covered by manufacturing and office buildings, or open grassed areas covering former slabs of demolished buildings. Surface runoff is conveyed to Sanders Creek through established outfalls in the Facility's stormwater collection system or as direct, non-point source runoff.

The monitoring program performed in compliance with the Facility's State Pollutant Discharge Elimination System (SPDES) permit had historically detected PCBs in stormwater at outfalls that discharge to Sanders Creek. A stormwater management and treatment system was installed to address stormwater discharges with detectable concentrations of PCBs. The stormwater treatment system began operating in spring 2011.

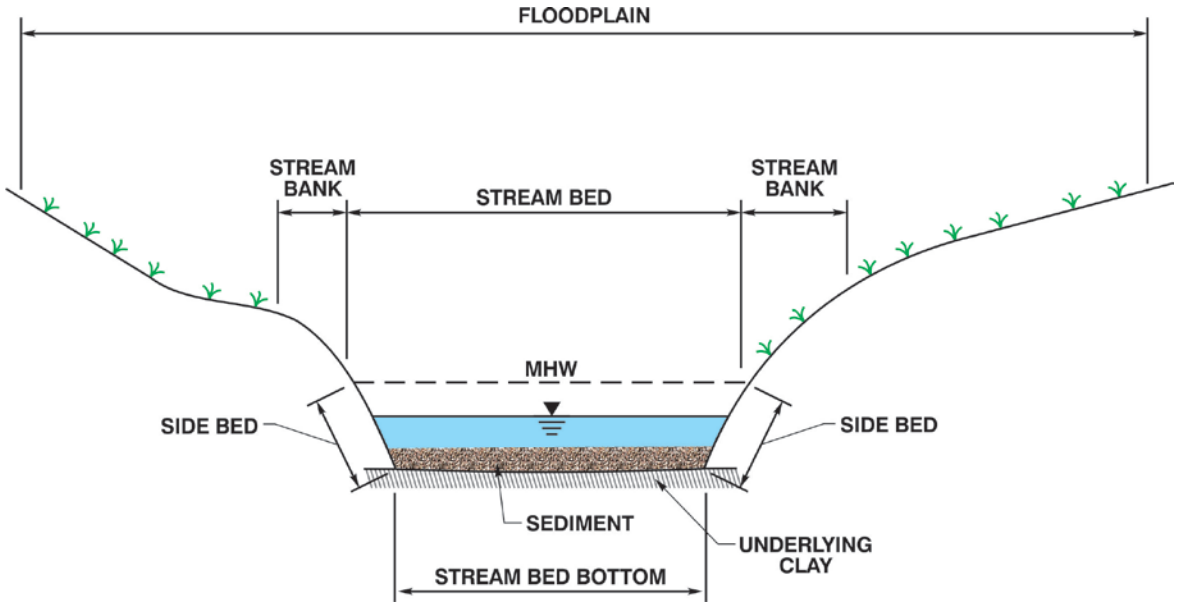
2.1.1 Stream Morphology

The SSAP identified sampling points at numerous locations in and adjacent to Sanders Creek. Key features of the stream morphology are defined below:

- Stream Bed Bottom – The stream bed bottom is defined as the base of the stream bed, which is relatively flat and generally contains loose, non-cohesive sediment.
- Sediment – NYSDEC defines sediment as unconsolidated particulate material found at the bottom of lakes, rivers, streams and other water bodies at bed elevations equal to or lower than the mean high water level. NYSDEC's Screening and Assessment of Contaminated Sediments guidance document dated June 2014 states that: "In flowing waters (e.g., streams and rivers), sediment is constantly being moved." Sediment may or may not be present along the entire watercourse.
- Side Bed – The side bed is defined as the portion of the stream bed that slopes up on either side of the stream bottom to the mean high water (MHW) elevation.
- Stream Bank – The stream bank is the land area adjacent to, and which slopes towards the bed of the watercourse, but does not extend more than 50 ft horizontally from the MHW elevation. The top of bank for Sanders Creek is typically characterized by a break in slope above the MHW elevation.
- Floodplain – The floodplain is the adjacent terrestrial area above the bank, potentially inundated during high flow events.

- Underlying Clay – The native material, generally consisting of clay, that underlies the unconsolidated sediment.

As appropriate, this terminology describing stream morphology will be used to describe conditions observed during execution of the SSAP.



2.1.2 Basis for Supplemental Sampling

The August 2016 SAR presented the following conclusions regarding the observed depositional pattern of PCB detections and updates to the CSM:

- The pattern of sampling points was appropriate and sufficient to define the horizontal extent of impacts, with the outer limits defined by samples with no exceedances of selected PCB Soil Cleanup Objectives (SCOs) as presented in 6 New York Codes, Rules and Regulations (NYCRR) Part 375

- The horizontal limits of floodplain detections suggest that the high water elevation is approximately 6 ft above the edge of the stream as depicted on the Site survey drawings. These limits of detections appear to be consistent with the recently observed extents of flooding following high precipitation events.

- The horizontal limit of floodplain detections can be used to define an excavation “cut line”. This cut line was matched to a topographic elevation for each section of stream (each section of stream being the area between culverts where water seeks a uniform elevation during flooding).

A meeting was held on November 2, 2016 attended by NYSDEC, UTC and AECOM to discuss the findings of the 2016 sampling event. Using the conclusions from the sampling data and the updated CSM as a basis, AECOM presented an approach to remediate Sanders Creek. The proposed approach also incorporated a restricted use SCO for protection of ecological resources;

precedence of a depth limitation for application of the ecological SCO at Ley Creek (within the same watershed as Sanders Creek), and EPA guidance justifying the use of depth limitations for ecological cleanup criteria. The approach is summarized in the following remediation criteria:

- Full removal of sediment (bounded by the stream side beds) to the underlying soil formation, which is not impacted.

- Utilization of a horizontal “cut line” in the floodplain defined by the topographic elevations in each section of the stream that corresponds to the horizontal limits of floodplain detections.

- A minimum excavation to 2 ft of material (where technically feasible) from the side bed, stream bank, and floodplain for those areas falling within the horizontal “cut line”. This depth of excavation is based on the use of a 2-ft depth limitation for application of the Part 375 ecological SCO (1,000 ug/kg) for areas within the side bed, stream bank, and floodplain. There are areas along the creek where excavation would undermine or otherwise disturb existing structures and utilities; for example, highway revetments, road culverts, utilities along the banks, building structures, and utility poles and towers. In such areas, it may be necessary to leave the soils undisturbed.

- A 10,000 ug/kg SCO for PCBs for soils below 2 ft, in combination with a geotextile demarcation/containment layer to be installed prior to backfilling.

The above remediation criteria were based on the CSM of PCB oils being transported on the creek surface water and being spread beyond the stream banks during high flow events.

During the meeting, NYSDEC said utilization of this remedial approach would require further justification concerning the depth limitation for the ecological SCO. Specifically, NYSDEC expressed concern that the pattern of contamination at depth did not appear fully consistent with the CSM presented and that other factors may be involved, such as re-working of the soils, and that leaving contamination at depth above 1,000 ug/kg would require NYSDEC to enforce deed restrictions on private properties.

It was agreed that a round of additional sampling would be performed to supplement the existing data. In general, additional samples would be collected at depth for locations exceeding 5,000 ug/kg at the 2-ft sample interval during the first round of sampling (i.e., April/May 2016). Borings were to be advanced at these locations and sampled beyond 2 ft to a boring depth of 4 ft. Additional samples were included to define the limits of the 50,000 ug/kg PCB concentration detected during the first round (location 4810-SB-N).

3.0 Field Investigation Activities

3.1 General Field Activities

The SSAP field investigation was performed in December 2016. Field activities included Site meetings, mobilization, health and safety monitoring, hand augering, collection and handling of soil samples, decontamination, and management of investigation-derived wastes. The field work was performed in accordance with the NYSDEC-approved SSAP, the site-specific Health and Safety Plan (HASP), the Generic Site Investigation Procedures (GSIP), and the Quality Assurance Project Plan (QAPP).

Work on Carrier-owned property was coordinated with Carrier and included review of Facility drawings. Work on offsite properties was performed in accordance with access agreements granted by the property owners.

3.2 Sample Collection Methodology and Locations

The field investigation program focused on the collection of floodplain, side bed, and outfall samples. A total of 22 locations were sampled and consisted of the following (**Figures 1 and 2**):

- 9 floodplain
- 11 side bed
- 2 outfall

The samples were collected using a stainless steel hand auger that was decontaminated between sampling locations. Sampling at the outfall and floodplain locations was performed vertically. Sampling at the side bed locations was performed approximately perpendicular to the side bed surface. Because of variations in side bed geometry, the boring angles varied from approximately horizontal to 45 degrees below horizontal. During sampling, the sampling technician stood in the creek and started the boring roughly 8 inches (in) to 1 ft above the creek (surface) water elevation.

At each location, a discrete sample was collected for each 6-in depth interval below 2 ft (i.e., 2 ft to 2.5 ft, 2.5 ft to 3 ft, 3 ft to 3.5 ft and 3.5 ft to 4 ft). However, the three proposed boring locations around 4810-SB-N were collected continuously at 6-inch intervals from ground surface to a total depth of 4 ft.

Two locations from the original sampling (6820-FP-S and 6550-SB-S) exceeded the 5,000 ug/kg criteria for the SSAP. However, these locations were in the TR-3 North Wall/SWTP Area (TR-3 Area). The soils at depth at these locations will be addressed as part of the proposed soil remediation for the TR-3 Area. Therefore, sampling at depth at these locations was not appropriate. To address this stream segment, sampling occurred at a new location, 6510-SB-S, approximately 40 ft west (downstream) of the TR-3 Area (**Figure 2)**. This location was sampled from the 2 ft to 4 ft interval.

3.3 Sample Nomenclature

Floodplain samples were identified based on their transect location relative to the nearest survey station of the Sanders Creek centerline. The floodplain sample names also include the abbreviation for floodplain (i.e., FP), the location of the sample either on the north or south side of the creek (i.e.,

N or S), and the relative location of the samples on the floodplain transect (i.e., low [L], mid [M], or high [H]). For example, sample 6790-FP-N-M was a floodplain sample (FP) collected near station 6790 on the north side (N) of the creek. The sample was the middle floodplain sample (M) collected from that transect.

Side bed samples were identified based on their location relative to the survey station of the Sanders Creek centerline and whether the sample was collected from the north or south side of the creek. For example, sample 6550-SB-N was a side bed (SB) sample collected near station 6550 on the north (N) side of the creek.

Outfall samples were collected from the pipe bedding material beneath the outfall structure. Outfall samples are identified based on their location relative to the survey station of the Sanders Creek centerline alignment and the Carrier facility outfall number. For example, sample 6970-OF-009 was an outfall sample (OF) collected from Carrier outfall 009 located near station 6970.

If a boring location was near an infrastructure feature it was given the designation “INF”.

The sample designations also include a designation that identifies the sample depth. For example: 2.0-2.5 (2 ft to 2.5 ft), 2.5-3.0 (2.5 ft to 3 ft), etc., consistent with the sample chains-of-custody.

3.4 Decontamination Procedures and IDW Management

Sampling equipment was decontaminated using the following procedures:

- Removal of soil with a stiff brush;
- Alconox and potable water wash;
- Potable water rinse; and
- Distilled/deionized water rinse.

Decontamination liquids were placed in a drum for subsequent offsite disposal.

3.5 Analytical Program

The samples were analyzed for PCBs by SGS Accutest Laboratories, located in Marlborough, MA.

The samples were transported by AECOM personnel or Accutest personnel to an Accutest sub-office located near the Site. Accutest then packaged and shipped the samples to the Accutest laboratory. Category B deliverable packages were requested for all sample delivery groups.

4.0 Investigation Results

This section provides a summary of the laboratory analytical results.

4.1 Data Validation

The chemical analytical results were validated by an AECOM chemist following NYSDEC DER-10 and USEPA Region II data validation procedures. The validated data is provided in a data usability summary report (DUSR).

The DUSR presents deviations from the relevant QC requirements and the associated qualifications to the sample data warranted by these deviations. QC issues discussed in the DUSR include surrogate sample recoveries, matrix spike recoveries, duplicate sample analyses, instrument calibration and performance and method and field blank sample analyses. The report also presents copies of the laboratory reporting forms with hand written qualifications made by the data reviewer. The data presented in the summary tables included in this report reflect these qualifications.

An electronic copy (disk) of the DUSR narrative and tables is provided in **Appendix A**. An electronic copy of the DUSR attachments (Form 1s, and Support Documentation) is available on request.

4.2 Analytical Results

A total of 100 soil samples and five duplicate samples were collected at multiple depths from 22 locations and submitted to the laboratory for analysis of PCBs. The analytical results are presented in **Table 1** and plotted on **Figures 3.0 through 3.3.**

5.0 Evaluation of Findings

Table 1 provides the PCB concentrations by depth for each supplemental sampling location. It includes data from the original April/May 2016 and the December 2016 sampling events. The sample locations are grouped by type (side bed, floodplain, and outfall).

Table 1 shows the approximate elevations for the top of the borings. Also, for the floodplain and outfall samples, the distance from the water's edge (as depicted on the November 2013 aerial survey) is presented. Three highlight annotations are used in the table. Grey denotes results where concentrations exceed 10,000 ug/kg at the 12-in to 24-in depth interval (based on the April/May 2016 sampling). Yellow shows December 2016 results where concentrations exceed 10,000 ug/kg at depths greater than 24-in. Red text indicates exceedance of the ecological SCO.

Figures 4-0 through 4-20 present cross section views at each sample location. Note that side bed samples were not taken vertically, but rather perpendicular to the side bed slope. Therefore, for these sample locations, a 4-ft boring depth does not represent 4 ft of vertical depth.

The cross-sections presented are generated from the November 2013 aerial topographic survey, while the angle of stream bank borings are depicted based on field notes from the December 2016 sampling and represent an approximate perpendicular orientation to the bank at the time of sampling. The side bed configurations presented in the cross sections were adjusted, where applicable, to reflect field observations.

5.1 Discussion of Analytical Results

Table 1 shows that PCB detections are present to the 4-ft boring depth at each location. In general, PCB concentrations decrease with depth. In all but two locations of the 22 locations, the concentration at the boring terminus was less than the concentration detected immediately above 2 ft bgs. Also, PCB concentrations in 15 of the 22 samples were at least an order of magnitude less at the boring terminus than in the upper 2 ft.

However, 16 of the 22 boring locations have one or more sample interval that exceeds the ecological SCO of 1,000 ug/kg below 2 ft. Ten of the 16 locations have PCBs above this SCO at the boring terminus. Based on these results, the depth of PCB concentrations has not been delineated relative to the ecological SCO.

Some useful patterns can be discerned when comparing the sample results to a concentration of 10,000 ug/kg rather than the ecological SCO. These are discussed below.

Correlation to the Detected Concentration at 2-ft Depth: The selection criterion for the locations to be re-sampled to the 4-ft depth was a PCB concentration exceeding 5,000 ug/kg from the April/May 2016 sampling 2-ft depth (plus 4 additional locations for areal delineation purposes). These locations can be divided into two groups:

- Group 1 consists of 11 locations with 2-ft depth concentrations less than 10,000 ug/kg.

  (3825-SB-S, 4800-SB-N, 4820-SB-N, 5250-SB-N, 6510-SB-S, 0590-FP-N, 2900-FP-S-L, 3000-FP-N, 4810-FP-N-L, 5240-FP-S-H, and 6060-FP-N-INF)

- Group 2, which consists of 11 locations with 2-ft depth concentrations greater than 10,000 ug/kg (grey highlight):

  (3600-FP-N, 3650-SB-N, 3950-SB-S, 4100-FP-S-L, 4725-SB-N, 4725-SB-S, 4810-SB-N, 5210-OF-001, 5320-FP-N-L, 5600-OF-003, and 5700-SB-S).

No samples from Group 1 exceeded 10,000 ug/kg in the depth interval of 2 ft to 4 ft. Seven of 11 samples from Group 2 did exceed 10,000 ug/kg in the 2-ft to 4-ft depth interval. These results indicate that the investigation criteria established for the SSAP (5,000 ug/kg at 2 ft) was appropriately conservative for evaluating the presence of concentrations exceeding 10,000 ug/kg at depths greater than 2 ft.

Furthermore, the results from Group 1 also indicate that concentrations do not exceed 10,000 ug/kg below 2 ft if the result at the 2-ft interval is below 10,000 ug/kg.

Correlation to Distance from the Water's Edge: Of the nine floodplain sample locations selected for the SSAP, only two are located at a distance greater than 10 ft from the water's edge

- Location 5240-FP-S-H is 65 ft from the water's edge. It shows no exceedances of 10,000 ug/kg beneath the 2-ft sample interval.
- Location 3600-FP-N is 20 ft from the water's edge and exceeds 10,000 ug/kg below 2 ft; however this location falls within a swale leading to the stream. Therefore, the exceedance of 10,000 ug/kg is not entirely representative of floodplain conditions and is more appropriately correlated with the side bed sample discussion provided below. Also, the 3600-FP-N location is within the Court Street Road off ramp from Rte 298 and the area may have been reworked during off ramp construction.
- The remaining seven floodplain sample locations are between 2 ft and 10 ft from the water's edge. Of these, only 5320-FP-N-L shows exceedances of 10,000 ug/kg beneath the 2-ft sample interval, and it is located only 2 ft from the water's edge, making it more representative of a side bed sample.

The results demonstrate that the areas where PCB concentrations exceed 10,000 ug/kg between the 2 ft and 4 ft boring depth are limited to the immediate area of the creek. This is further supported by the following correlation.

Correlation to Sample Type: **Table 1** shows that of the 22 locations in the SSAP, 11 are side bed locations, nine are floodplain locations, and two are outfall locations. Only two of nine floodplain samples show exceedances of 10,000 ug/kg below the 2-ft boring depth. As discussed above, both locations (3600-FP-N and 5320-FP-N-L) are more representative of a side bed sample results.

Of the seven locations that show exceedances of 10,000 mg/kg beyond the 2-ft sample interval, five are side bed samples and the other two are flood samples, which as explained above, are more representative of side bed samples.

This again suggests that concentrations greater than 10,000 ug/kg beyond the 2-ft depth are restricted to the creek side bed and immediately adjacent areas.

Correlation to Cross Sections: **Figures 4.0 through 4.20** show the sample borings in relation to stream cross-sections at those locations. The sections also show the previously proposed 2-ft excavation cut. The figures illustrate a number of points:

- Side bed samples (being generally perpendicular to the bank) do not represent vertical depth from existing grade, but rather, depth into the bank.

- The stream bed is a limiting horizon regarding depth of contamination. As documented in the August 2016 SAR, there were no exceedances of residential or protection of ecological SCOs in the stream bed samples.

- The seven locations where concentrations greater than 10,000 ug/kg were encountered beyond the 2-ft depth interval are restricted to the creek side bed. When viewed within the context of the angle of the boring and the originally proposed limit of excavation, they do not represent a significant increase in excavation volume required to remove concentrations exceeding 10,000 ug/kg beyond the 2 ft depth.

The correlations discussed above demonstrate that the highest contamination both horizontally and vertically is along the side bed and not the floodplain. Based on the data, AECOM believes that the contamination at depth resulted from infiltration of PCB oils from the surface (possibly following cracks caused by plant roots or other causes), although re-working of the soil likely occurred in some areas.

The August 2016 SAR demonstrated that VOC impacts are present primarily on Carrier property in the area north of the TR-3 North Wall (these soils are already scheduled to be addressed as part of the TR-3 North Wall/SWTP remediation). The SAR further establishes that metal and SVOC soil impacts are predominantly co-located with PCBs. Therefore, it is appropriate to use the PCBs SCOs as an indicator compound for the purpose of establishing the Site limits of soil removal.

6.0 Other Considerations

In support of the argument that an alternate SCO of 10,000 ug/kg should be applied for soils below 2 ft, AECOM offers the following additional justifications based on DEC regulations, guidance and previous decisions at downstream sites, as well as scientific literature:

1. The CO presents the remedial goals for PCBs in Sanders Creek as 100 ug/kg criteria for aquatic biota tissue and prevention of significant levels of PCBs migrating through storm sewers. Migration of PCBs through the storm sewers has already been addressed. For aquatic biota, the proposed remedy includes a minimum 2-ft side bed/floodplain excavation (greater where necessary to meet the alternate 10,000 ug/kg SCO), use of a demarcation layer that will define and contain the residual contamination, and placement of a minimum 2-ft soil cover. Thus, any residual PCB impacts would not be available for aquatic biota uptake. Therefore, there would be no appreciable difference in achieving the CO goals by removing material exceeding the ecological SCO of 1,000 ug/kg when compared to an alternate criterion of 10,000 ug/kg for material below 2 ft.

2. To compare the two alternatives in a broader context, **Table 2** presents a comparison regarding the Generic Remedial Action Objectives (RAOs) presented in DER-10. **Table 2** shows that there is no benefit of the 1,000 ug/kg SCO in achieving groundwater, surface water, sediment, soil, or soil vapor RAOs. For soil RAOs, there is no benefit regarding public health protection or prevention of migration of contaminants. Also regarding the environmental protection aspect of soil SCOs, there is no benefit to the prevention of migration. There may be some marginal benefit to prevention of impacts to biota from ingestion, but since the proposed 2-ft limit for ecological SCO is scientifically supported in USEPA's Determination of the Biological Relevant Sampling for Terrestrial and Aquatic Ecological Risk Assessment (October 2015), this would be insignificant.

3. **Table 3** compares the two alternatives regarding the Remedial Selection Evaluation Criteria presented in DER-10. **Table 3** demonstrates that there is no appreciable benefit to the more stringent criteria regarding the overall protectiveness, compliance with standards, or long term effectiveness. Conversely, **Table 3** shows significant negative implications regarding short-term effectiveness, implementability, and cost effectiveness.

4. DER-10 paragraph 4.1(d).2 presents a hierarchy of preferences for addressing contamination. Removal and treatment is the most preferred; however, it states that *"if removal and/or treatment of all such contamination is determined not to be feasible, such contamination shall be removed or treated to the greatest extent feasible."* Containment, which is presented as the second preference, states that *"If full containment is determined not to be feasible, the remedy should provide containment to the greatest extent feasible."* Consistent with these requirements, AECOM is proposing that the contamination exceeding the 1,000 ug/kg in the top 2 ft and 10,000 ug/kg below 2 ft be removed to the extent feasible and the remaining impacts be contained to the extent feasible.

5. *CP-51 Section V.I.1 states: "**For Non-BCP Sites**: An acceptable presumptive remedy for soil where neither the unrestricted SCOs nor the ESCOs are applied in the remedial program may include a soil clean-up level for PCBs of 1 ppm in the surface soil and 10 ppm in the*

subsurface soils." Although ecological SCOs are being proposed for the remedy, AECOM proposes that this criterion be limited to surface soils (top 2 ft) and not the subsurface soils.

6. The proposed 2-ft limit for ecological SCO is scientifically supported in USEPA's Determination of the Biological Relevant Sampling for Terrestrial and Aquatic Ecological Risk Assessment (October 2015). Also, the minimum 2-ft excavation will allow for backfill to restore the surface and meet the minimum requirements of soil cover as defined in DER-10 Chapter 4.1 (f).

7. As discussed during the November 2016 meeting, application of the ecological SCO was limited to 2 ft bgs in the Lower Ley Creek ROD. The depth limitation for Lower Ley Creek was established by referencing the Baseline Ecological Risk Assessment (BERA) conducted for the General Motors Inland Fisher Guide (GM-IFG) Off-Site Areas of the Onondaga Lake Superfund site (also referred to as Upper Ley Creek).

   The BERA for Upper Ley Creek used qualitative evaluation to assess potential ecological exposures in subsurface soil (defined as depths greater than 1 ft bgs for Upper Ley Creek). The BERA sates that in the Ley Creek Floodplain Exposure Area, much of the vegetative community is comprised of herbaceous species with shallow (e.g., less than 1 ft bgs) root systems; however, some mature trees were noted and root systems of these woody species would be exposed to constituents detected below 1 ft bgs. For burrowing animals, the interval where biological activity was most often found was determined to be from 0 ft to 1 ft bgs and was therefore the primary interval for biological exposure. However, exposure to constituents was believed to occur to a depth of 2 ft bgs during winter months. Based on these exposure scenarios, the BERA concluded that:

   "*Although constituents were detected in subsurface soils of National Grid Wetlands and Ley Creek Floodplain Exposure areas above SCGs [standards, criteria and guidance] applicable to surface soils, the potential risk to plant roots and/or burrowing animals potentially exposed to the subsoils are expected to be minimal due the likelihood of an incomplete exposure pathway to these receptors…"*

   Sanders Creek is within the Ley Creek watershed and has similar geology and habitat. Therefore, the Upper Ley Creek BERA is as valid a reference for evaluating ecological exposures at Sanders Creek as it is for Lower Ley Creek. Furthermore, use the Upper Ley Creek BERA for evaluating Sanders Creek is considered conservative for the following reasons:

   a. The currently proposed remedy for Sanders Creek would apply the ecological SCO to a depth of 2 ft bgs, which will increase the likelihood of an incomplete exposure pathway when compared to the assessment in the GM-IFG BERA.

   b. In the GM-IFG BERA, the degree to which detected PCB concentrations exceeded the respective SCG was evaluated based on the ratio of average and maximum PCB concentrations to the SCG (in this case for soil, the SCG was the ecological SCO of 1,000 ug/kg). For example, a ratio of 2 for the maximum detected concentration would mean that the maximum detection exceeded the SCO by a factor of 2.

      For the GM-IFG site, subsurface detections were compared to the SCG for samples collected between the interval of 1 ft to 20 ft bgs. For total PCBs, the resulting ratios of average and maximum concentrations to the SCO were 13 and 130, respectively. For Sanders Creek the 22 sample location results provided in Table 1 of this SSAR were used to

calculate the same ratios for concentrations detected below 2 ft bgs. The resulting ratios of the average and maximum detected concentrations to the ecological SCO are 4.2 and 53. These values are less than half of the comparable ratios for the GM-IFG site. These ratios go even lower if the proposed removal criteria of 10,000 ug/kg is factored in.

8. NYCCR 375-1.8(f) states that the remedy selection shall be based on consideration of nine factors. Factor nine is land use, including the current, intended and reasonably anticipated future land uses of the site and its surroundings. The entire Site is zoned industrial (**Figure 5)**, although there are some existing commercial uses, but no nearby residential use. AECOM is not proposing the industrial restricted use SCO of 25,000 ug/kg.

9. The *New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document*, dated September 2006, includes discussions pertaining to developing SCOs for protection of ecological resources. With respect to PCBs, the document references TSCA regulations, stating that TSCA does not directly address protection of ecological resources, although 40CFR 761.61(a)(4)(v) of the regulation states that where the exposure of animal life is expected to be a concern at a particular site, the cleanup of the area should be in accordance with the higher occupancy cleanup levels. The 40CFR 761.61(a)(4)(i) cleanup level for a high occupancy site is >1,000 ug/kg to <= 10,000 ug/kg with a cap.

10. In either scenario (ecological SCO or the alternate of 10,000 ug/kg in subsurface soil), soil removal to criterion will result in a restricted use status as defined in "NYCCR 375-1.8(g)(1):

    *(ii) "**Restricted use**" which is a use with imposed restrictions, such as environmental easements, which as part of the remedy selected for the site require a **site management plan** which relies on **institutional controls or engineering controls** to manage exposure to contamination remaining at a site."*

    To address residual soil contamination a soils management plan will be a component of the site management plan, regardless of the alternative.

11. The proposed remedial action is to remove soils exceeding the alternate SCO of 10,000 ug/kg below 2 ft. AECOM has given consideration as to whether potential residual PCB levels in those soils (i.e., less than 10,000 ug/kg) would impact groundwater at unacceptable levels. Our conclusion is that they will not because of the hydrophopic nature of PCBs and in particular their tendency to be sorbed by organic matter in soil resulting low solubility in water. This conclusion is supported by the Site-wide groundwater monitoring data and technical support documents.

    AECOM reviewed the most recent facility and AOC-G groundwater data. This involved 97 wells for which PCBs were analyzed:

    - 17 wells from the Supplemental Well Installation Sampling and Analysis Report, (AECOM, Report Pending)
    - 5 wells from the Southeast Debris Pile Sampling and Analysis Report (AECOM, June 2016)
    - 5 wells from the TR-3 North Wall / SWTP IRM Predesign Investigation Report (AECOM, July 2016)

- 8 wells from the A&R Building Area AOC Sampling and Analysis Report (AECOM July 2016

- 43 wells from the Site-Wide Groundwater Monitoring Report (Ensafe, August 2015)

- 19 wells from the AOC-G RCRA Facility Investigation Report (AECOM, April 2015)

Of those wells, 36 are within 200 feet of Sanders Creek and none of those had a PCB detection. Of 97 wells there were only three detections of PCBs:

- Monitoring well MW-23 (June 19, 2015) had a detection of 0.28 ug/l (the NYSDEC GW standard is 0.09 ug/l). This well is located on the western edge of the TR-1 investigation area. This monitoring well is located in an area of the UTC/Carrier facility where light non-aqueous phase liquid (LNAPL) containing high levels of PCBs has been observed in several monitoring wells. Yet, 11 other wells sampled in this area showed no detections.

- Monitoring well AR-SB-04 (April 18, 2016) had a detection of 0.063 ug/l. This was an unfiltered detection from a 1-inch temporary piezometer located upstream of the Site in the former pond area. The filtered sample from this location showed no detection suggesting that the detected PCBs in the unfiltered sample were likely absorbed to sediment in the sample, and potentially less mobile.

- Monitoring well TR-06 (December 4, 2014) had a detection of 0.35 ug/l. This well is located in the AOC-G landfill site and in close proximity to eight geoprobe locations with soil samples that exceeded the restricted use industrial SCO of 25,000 ug/kg, two of which exhibited PCB concentrations of 220,000 ug/kg and 258,000 ug/kg. However, 13 other wells in the landfill area showed no PCB detections.

The data from monitoring wells on the UTC/Carrier facility suggests that, although PCBs have been detected in soil samples, the concentrations have not resulted in significant groundwater contamination.

Post-remediation residual concentrations for the proposed remedy will potentially remain above the protection to groundwater SCO of 3,200 ug/kg but will be below the alternate SCO of 10,000 ug/kg. Based on the data from the UTC/Carrier facility, leaving these residual PCB levels in soils adjacent to Sanders Creek will not impact groundwater. Considering that the UTC/Carrier facility adjoins Sanders Creek for over 50 percent of length of the reach that traverses the Site (and over 70 percent of the un-culverted length), AECOM believes that this conclusion can be extended to the entire length of the Site.

Part 375, which sets the restricted use protection of groundwater standard for PCB of 3,200 ug/kg, provides a reference of how such groundwater protections SCO are calculated: *New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document, dated September 2006* (Technical Support Document). Some key excerpts are provided below:

> "*The soil-water partitioning theory is used in determining soil concentrations or cleanup objectives that would be protective of groundwater quality for its best use, which is as a source of drinking water. This theory is conservative and assumes that the contaminated soil and groundwater are in direct contact."*

"Organic soil water partitioning theory itself is very conservative and probably overestimates the concentration of contaminants in the leachate generated from contaminated soil. Further, this theory assumes a continuous flow of leachate and an infinite source of contamination, which is seldom the case."

As discussed in the Technical Support Document, the protection of groundwater SCOs are not only conservative estimates, but are derived based on the drinking water standards. However, the groundwater at the Site is not a drinking water source, and never likely to be one, for several reasons:

- It is in a low yield formation and therefore not suitable as a drinking water aquifer;
- It is a shallow aquifer influenced by surface water and therefore not suitable as a drinking water aquifer; and
- There is a readily available municipal source of drinking water.

Furthermore, with respect to Part 375-6.5(1), which identifies conditions where the protection of groundwater SCO may not be applicable, AECOM provides the following:

Part 375-6.5(1)(i) *the groundwater standard contravention is the result of an on-site source which is addressed by the remedial program*;

AECOM response: Based on the existing groundwater data as discussed above, contraventions of the groundwater standard along Sanders Creek would not be expected if the proposed alternative SCO of 10,000 ug/kg is applied;

Part 375-6.5(1)(ii) *an environmental easement will be put in place which provides for a groundwater use restriction on the site as set forth in paragraph 375-1.8(h)(2)*;

AECOM response: An institutional control will be placed on properties along Sanders Creek to provide restrictions on groundwater use.

Part 375-6.5(1)(iii) *the Department determines that contaminated groundwater at the site is not migrating, or likely to migrate, off-site*;

AECOM response: As there is no anticipated impact to groundwater, contaminated groundwater is not migrating offsite; and

Part 375-6.5(1)(iv) *– the Department determines the groundwater quality will improve over time*;

AECOM response: Although there is no current contravention of groundwater standards, with the removal of impacted soils to the proposed SCOs, the proposed remedial program will further reduce the possibility of groundwater impacts over time.

7.0 Conclusions

The data from samples collected in April/May 2016 indicated that horizontal limit of PCB concentrations within Sanders Creek and the adjoining floodplain exceeding the ecological SCO had been delineated. This information was used as a significant line of evidence supporting the CSM, which included PCB oils spread by surface water and extending to the horizontal limits of the stream observed during high water events. However, data from the first round of sampling did not extend to a sufficient depth to provide vertical delineation.

Results from the second round of sampling generally showed decreases in concentrations with depth. However, in several borings, PCB concentrations exceeded 1,000 ug/kg in the interval between 2 ft and 4 ft indicating that the vertical extent of PCBs has not been fully delineated with respect to the ecological SCO.

The current data set is informative when comparing concentrations to an alternative depth criterion of 10,000 ug/kg. Considering that the side bed is the most fissured area of the Site (erosion, sloughs, exposed root systems, exposed utilities, cracked and un-vegetated surfaces), one should expect that this zone would be the most likely to have a pattern of impacts beyond the 2-ft depth of surface soils. And this is what the data shows. Nevertheless, the apparent distribution of PCBs spread by surface water does not preclude the possibility that PCBs were redistributed by soil regrading during historical construction activities.

The December 2016 data show that 11 floodplain and outfall samples had no concentrations exceeding 10,000 ug/kg beneath the 2-ft depth (with the exception of the two locations, which are more representative of side bed samples, as explained above). This also is consistent with the CSM of PCBs spread by surface water.

The April/May 2016 sampling showed that there are no PCB exceedances in the stream bed. PCBs oils are light non-aqueous phase liquids (LNAPLs), are immiscible with water, and have a low aqueous solubility. The analytical results that show the absence of PCB impacts in the stream bed, which is consistently beneath the water surface (and any LNAPL smear zone), provides another data set supporting the CSM.

In summary, PCB concentrations greater than 10,000 ug/kg and deeper than 2 ft were identified in the side beds only and this represents a greater depositional depth of penetration (into the side bed) rather than deeper vertical depth of contamination. The cross sections illustrate that that additional volume of excavation required to address such areas (beyond 2 ft deep) is nominal.

Based on the entire data set now available, the depositional pattern at depth of PCBs and the stream's close proximity to structures and utilities indicates that achieving the ecological SCO at depths greater than 2 ft would require significant excavation, likely extensive use of shoring, or is not practicable. AECOM's proposed 2-ft excavation would remediate most areas exceeding an alternative depth criterion of 10,000 ug/kg with limited need for additional excavation in the side beds or banks. Also, the placement of a minimum of 2 ft of clean, imported backfill would function as a soil cover. Based on our comparison of the alternatives, AECOM concludes that application of the ecological SCO for all soils is not appropriate as a Site-wide SCO.

Based on the regulatory and scientific arguments presented in Section 6, AECOM maintains that removal of sediment from the stream bed bottom, application an ecological SCO for the upper 2 ft, and the alternate SCO of 10,000 ug/kg for soil below 2 ft in the side bed, stream bank, and floodplain will achieve the remedial goals of the CO. Furthermore, application of the ecological SCO for subsurface soils will provide no benefit towards achieving the remedial goals.

8.0 Recommendations

AECOM recommends that that the project proceed to the development of a Remedial Action Work Plan (RAWP) based on the approach presented at the November 2, 2016 meeting, specifically, a minimum 2-ft excavation (except where technically infeasible) and an SCO of 10,000 ug/kg for subsurface soils. Key components of the RAWP would be:

- Identification of areas where existing conditions, structures, and utilities would preclude excavation as technically impracticable.

- Development of a post excavation confirmation sampling plan.

During design, UTC may wish to perform additional sampling in the areas of wide floodplains to confirm that excavation beyond the 2 ft minimum cut would not be required as a result of confirmatory sampling. These areas have the highest potential for significantly increasing the volume of excavation.

In summary, the proposed SCO of 10,000 ug/kg below 2 ft, in combination with Carrier's storm water management program, will achieve the CO remedial goals of (prevention of significant levels of PCBs migrating through storm sewers and 100 ug/kg PCB criteria for aquatic biota tissue) as effectively as an SCO of 1,000 ug/kg. And, it is overall equally effective in meeting the DER-10 Generic RAOs. Furthermore, it is compliant with DER-10, 6 NYCRR Part 375, and CP-51. Finally, when the two alternatives are compared using the DER-10 Remedy Selection Evaluation Criteria, it is demonstrated that there is no appreciable benefit to the more stringent criterion regarding the overall protectiveness, compliance with standards, or long-term effectiveness. Conversely, it demonstrates significant negative implications regarding short-term effectiveness, implementability, and cost effectiveness.

Tables

SUPPLEMENTAL SANDERS CREEK SAMPLING

TABLE 1
PCB Results Grouped by By Sample Type

Side Bank Samples

	3650-SB-N	3825-SB-S	3950-SB-S	4725-SB-N	4725-SB-S	4800-SB-N	4810-SB-N	4820-SB-N	5250-SB-N	5700-SB-S	6510-SB-S
Aprox. GS elevation	383	380	380	386	386	386	386	386	389	388	390
Depth (inches)											
0-6	9,690	3,167	1,406	13,470	3,109	3,398	6,280	765	6,150	356	NS
6-12	22,800	4,610	6,060	15,170	8,730	5,910	4,890	574	503	575	NS
12-18	NS	NS	NS	NS	NS	4,700	NS	187	NS	NS	NS
18-24	NS	NS	NS	NS	NS	4,120	NS	202	NS	NS	NS
12-24	16,460	5,750	10,410	11,170	13,270	NS	57,200	NS	6,810	19,300	NS
24-30	23,000	583	9,210	9,110	11,360	5,510	16,740	1,630	425	32	2,830
30-36	10,110	245	17,500	3,038	363	415	9,210	2,236	2,999	72	4,320
36-42	10,640	354	7,890	3,170	458	160	20,560	295	236	717	3,800
42-48	6,670	27	111	10,100	558	71	4,240	191	104	260	3,970

Flood Plain Sampling

	0590-FP-N	2900-FP-S-L	3000-FP-N	3600-FP-N	4100-FP-S-L	4810-FP-N-L	5240-FP-S-H	5320-FP-N-L	6060-FP-N-INF
Distance from Water's Edge (ft)	5	3	10	20	10	10	65	2	3
Aprox. GS elevation	376	381	385	385	386	392	394	390	390
Depth (inches)									
0-6	2,613	2,705	2,231	3,483	1,527	310	4,090	3,160	752
6-12	3,307	2,510	6,170	11,770	5,670	314	4,580	26,000	964
12-18	NS	NS	NS	NS	NS	427	NS	NS	NS
18-24	NS	NS	NS	NS	NS	337	NS	NS	NS
12-24	5,750	5,820	6,410	13,100	11,100	NS	9,620	10,850	5,260
24-30	1,260	45	2,986	2,660	6,020	2,920	314	19,720	237
30-36	4,250	45	643	1,250	629	1,430	448	52,700	77
36-42	142	32	348	21,800	378	2,888	379	9,530	39
42-48	525	273	1,342	14,600	1,870	1,217	239	2,961	30

Outfall Samples

5210-OF-001	5600-OF-003
10	--
389	390
868	2,810
2,408	13,300
NS	NS
NS	NS
10,240	12,600
2,320	43
3,020	654
4,700	26
1,765	90

Notes:
Total PCBs in ug/kg
NS - Not Sampled
12-24 inch samples collected in April/May 2016
Red indicates PCB results > 1000 ug/kg
PCB results > 10,000 ug/kg @ > 2 ft
PCB results > 10,000 ug/kg @ 2 ft

Table 2
Generic Remedial Action Objectives (RAOs)
Comparison of Alternatives
Sanders Creek Soil Excavation Criteria Beneath 2-feet
10,000 ug/kg Verses 1,000 ug/kg

RAO	10,000 ug/kg	1,000 ug/kg
Groundwater		
Public Health Protection		
Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.	Will Require Institutional Controls (Environmental Easement)	Will Require Institutional Controls (Environmental Easement)
Prevent contact with, or inhalation of volatiles, from contaminated groundwater.	VOCs not a Primary COC	VOCs not a Primary COC
Environmental Protection		
Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.	N/A	N/A
Prevent the discharge of contaminants to surface water (if appropriate add: and sediment).	N/A	N/A
Remove the source of ground or surface water contamination.	Achieved	Achieved
Soil		
Public Health Protection		
Prevent ingestion/direct contact with contaminated soil.	Achieved	Achieved
Prevent inhalation exposure to contaminants volatilizing from soil	N/A	N/A
Environmental Protection		
Prevent migration of contaminants that would result in (include all appropriate media: groundwater, surface water, or sediment) contamination.	Achieved	Achieved
Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.	Achieved	Minimal Improvement over the 10,000 ug/kg criterion.

Table 2
Generic Remedial Action Objectives (RAOs)
Comparison of Alternatives
Sanders Creek Soil Excavation Criteria Beneath 2-feet
10,000 ug/kg Verses 1,000 ug/kg

Surface Water		
Public Health Protection		
Prevent ingestion of water impacted by contaminants.	Achieved	Achieved
Prevent contact or inhalation of contaminants from impacted water bodies.	Achieved	Achieved
Prevent surface water contamination which may result in fish advisories.	Achieved	Achieved
Environmental Protection		
Restore surface water to ambient water quality criteria for the contaminant of concern.	Achieved	Achieved
Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.	Achieved	Achieved
Sediment		
Public Health Protection		
Prevent direct contact with contaminated sediments	Achieved	Achieved
Prevent surface water contamination which may result in fish advisories.	Achieved	Achieved
Environmental Protection		
Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).	Achieved	Achieved
Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.	Achieved	Achieved
Restore sediments to pre-release/background conditions to the extent feasible.	Achieved	Achieved
Soil Vapor		
Public Health Protection		
Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.	N/A	N/A

N/A = Not Applicable

Source: *Technical Guidance for Site Investigation and Remediation (DER-10) Generic Remedial Action Objectives (RAOs)*. May 2010.
http://www.dec.ny.gov/regulations/67560.html.

Table 3

Remedy Selection Evaluation Criteria
Comparison of Alternatives
Sanders Creek Soil Excavation Criteria Beneath 2-feet
10,000 ug/kg Verses 1,000 ug/kg

Criteria	10,000 ug/kg	1,000 ug/kg
Overall protectiveness of the public health and the environment	**Equivalent**	**Equivalent**
How alternative would eliminate, reduce, or control through removal, treatment, containment, engineering controls, or institutional controls	Equivalent	Equivalent
Ability to achieve RAOs	Equivalent	Equivalent
Draws on assessments of other evaluation criteria, especially long-term effectiveness, short-term effectiveness, and compliance with SCGs	See below, equivalent long term effectiveness but much less short term impacts.	See below, equivalent long term effectiveness but much greater short term impacts.
Compliance with standards, criteria, and guidance (SCGs)	**Yes**	**Yes**
Conformance with standards and criteria is required, unless good cause exists why conformity should be dispensed with	Conforms	Conforms
Consideration is also given to guidance which, through the application of scientific and engineering judgment, is determined to be applicable to the alternative evaluation	Guidance justifies application of ESCO to 2-feet	-
All SCGs for the site are identified along with a discussion of whether or not the remedy will achieve compliance	Done	Done
For those SCGs that will not be met, acceptable documentation of the basis must be submitted to DER for approval	Justification of application of ESCO to 2-feet provided	-
Long-term effectiveness and permanence	**Equivalent**	**Equivalent**
If contamination will remain on- or off-site after the selected remedy has been implemented, this evaluation will assess the impact of the remaining contamination on human exposures, ecological receptors, or impacts to the environment	Contamination will remain below 10,000 ug/kg below 2 feet, but will be contained to protect against human exposure, ecological receptors, and impacts to the environment	Contamination exceeding the ESCO will not remain
The evaluation of institutional and/or engineering controls performed in accordance with subdivision 4.3(b) is considered	Equivalent	Equivalent

Table 3

Remedy Selection Evaluation Criteria
Comparison of Alternatives
Sanders Creek Soil Excavation Criteria Beneath 2-feet
10,000 ug/kg Verses 1,000 ug/kg

Reduction of toxicity, mobility, or volume of contamination through treatment	NA	NA
Short-term impact and effectiveness	**Less impact**	**More impact**
Identify the potential human exposures, adverse environmental impacts, and nuisance conditions at the site resulting from the implementation of the remedy or alternative	Less than half the material removed with half the impacts.	More than twice the material removed with twice the impacts.
Discuss engineering controls that would be used to mitigate the short-term impacts	Equivalent for both	Equivalent for both
Estimate the length of time needed to implement the remedy or alternative, including time to achieve the remedial objectives	Two construction seasons	Four construction seasons
While sustainability will be a consideration in remedy selection, it will not change any existing statute, regulation, or guidance	Not applicable to this comparison	Not applicable to this comparison
Implementability	**Implementable**	**Less implementable**
Technical feasibility includes difficulties associated with construction and the ability to monitor the effectiveness of an alternative or remedy	Technically feasible, except for localized areas with existing structures or steep banks	Technically infeasible because of the uncertainty regarding the depth of contamination to this level.
Administrative feasibility includes the availability of the necessary personnel and material and potential difficulties in obtaining specific operating approvals, access for construction, etc	Feasible	Feasible
Evaluate the reliability and viability of implementation of the institutional or engineering controls necessary for a remedy	Reliable and viable	Reliable and viable

Table 3

Remedy Selection Evaluation Criteria
Comparison of Alternatives
Sanders Creek Soil Excavation Criteria Beneath 2-feet
10,000 ug/kg Verses 1,000 ug/kg

Cost effectiveness	**Cost effective**	**Not cost effective**
A remedy is cost effective if its costs are proportional to its overall effectiveness	Cost effective	Not cost effective. More than double the cost with minimal improvement in achieving RAOs
Estimate capital costs and costs associated with site management for each alternative	$11 million	$22+ million
Land use	**Considered, see below**	**Considered, see below**
Consider current and historical use, consistency of proposed use with applicable zoning laws, brownfield opportunity areas, etc. (full list in DER-10)	Zoned Industrial with existing industrial and commercial usage. Remedy is based on ESCO to 2-foot depth	Zoned Industrial with existing industrial and commercial usage. Remedy is based on ESCO.
The final use determination for a site must be made to complete the remedy-selection stage of the remedial program	Same	Same
DER may approve an unrestricted use remedial program which requires no restrictions placed on use at the site, or a restricted-use remedial program which relies upon restrictions on the use of the site	Restricted use	Restricted use
Community acceptance	**Not Applicable at this time**	**Not Applicable at this time**
Any public comment relative to these Criteria will be considered by DER after the close of the public comment period	Not Applicable at this time	Not Applicable at this time
Documentation of the public comments received is to be consistent with the citizen participation plan identified for a remedial program in accordance with applicable DEC policy	Not Applicable at this time	Not Applicable at this time

Source: New York State Department of Environmental Conservation, DER-10.

Figures

N

TARBELL RD

THOMPSON RD

COURT STREET RD

CARRIER PKWY

RIDINGS RD

DEERE RD

THOMPSON RD

90

298

SEE FIGURE 2

SEE FIGURE 2

4100-FP-S-L (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	11100

3600-FP-N (12" - 24")| CRIT 1 | CRIT 2 | 5/16			
PCBs:			
Total PCBs	1000	1000	13100

3000-FP-N (12" - 24")| CRIT 1 | CRIT 2 | 5/16			
PCBs:			
Total PCBs	1000	1000	6410

0590-FP-N (12" - 24")| CRIT 1 | CRIT 2 | 5/16			
PCBs:			
Total PCBs	1000	1000	5750

2900-FP-S-L (12" - 24")| CRIT 1 | CRIT 2 | 5/16			
PCBs:			
Total PCBs	1000	1000	5820

3650-SB-N (12" - 24")| CRIT 1 | CRIT 2 | 5/16			
PCBs:			
Total PCBs	1000	1000	16460

3825-SB-S (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	5750

3950-SB-S (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	10410

4725-SB-S (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	13270

4725-SB-N (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	11170

5210-OF-001 (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	10240

5250-SB-N (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	6810

5320-FP-N-L (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	10850

6060-FP-N-INF (12" - 24")| CRIT 1 | CRIT 2 | 5/16			
PCBs:			
Total PCBs	1000	1000	5260

5700-SB-S (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	19300

5600-OF-003 (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	12600

5240-FP-S-H (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	9620

4810-SB-N (12" - 24")| CRIT 1 | CRIT 2 | 4/16			
PCBs:			
Total PCBs	1000	1000	57200

Legend

- Floodplain Sample
- Side Bed Sample
- Outfall Area Sample

CRITERIA: CRIT 1 = 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Ecological Resources.
CRIT 2 = 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Residential.
NOTES: Units shown in µg/kg. Sample locations shown are approximate.
SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

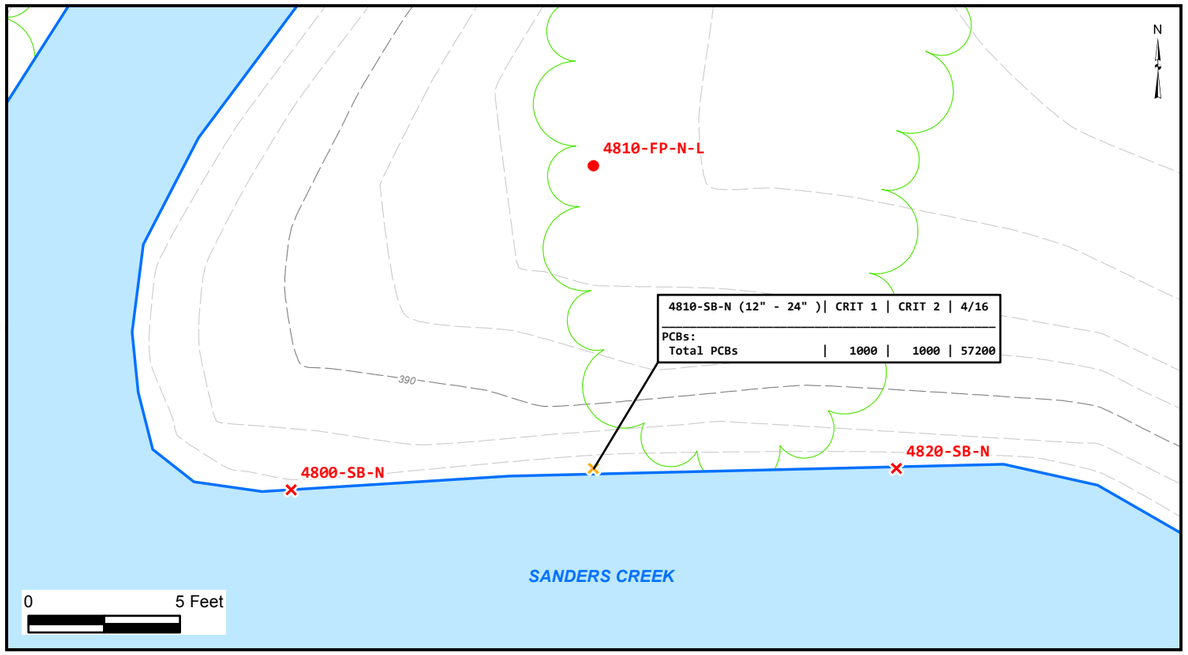
500 0 500 Feet

SANDERS CREEK UTC/CARRIER SITE SUPPLEMENTAL SAMPLING PLAN

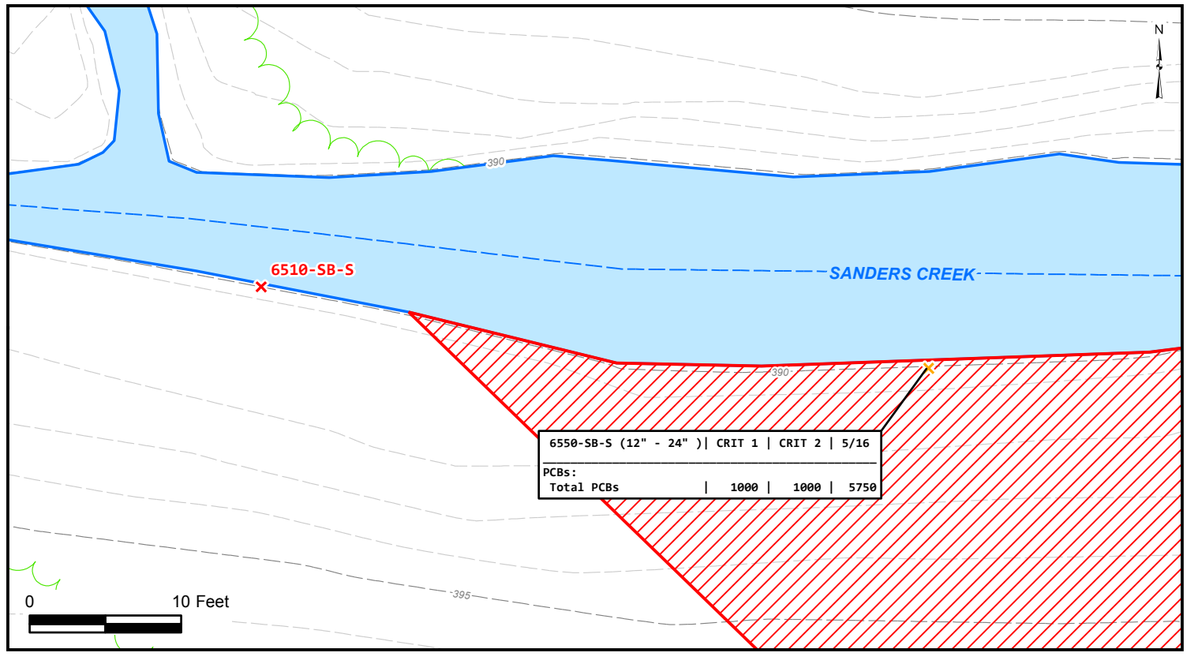
AECOM

FIGURE 1

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SANDERS CREEK\SUPPLEMENTAL SAMPLING PLAN.mxd 11/16/2016



4810-SB-N SUPPLEMENTAL SAMPLE LOCATIONS



6550-SB-S SHIFTED SUPPLEMENTAL SAMPLE LOCATION

Legend

- Proposed Floodplain Sample
- Proposed Side Bed Sample
- Side Bed Sample
- TR-3 Area of Proposed Soil Remediation

CRITERIA: CRIT 1 = 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Ecological Resources.
CRIT 2 = 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Residential.
NOTES: Units shown in µg/kg. Sample locations shown are approximate.

SANDERS CREEK
UTC/CARRIER SITE
SUPPLEMENTAL SAMPLING PLAN

AECOM

FIGURE 2

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SANDERS CREEK\RESAMPLING PLAN.mxd 3/7/2017

N

5250-SB-N	
0" - 6"	6150
6" - 12"	503
12" - 24"	6810
24" - 30"	425
30" - 36"	2999
36" - 42"	342
42" - 48"	104

5320-FP-N-L	
0" - 6"	3160
6" - 12"	26000
12" - 24"	10850
24" - 30"	19720
30" - 36"	52700
36" - 42"	9430
42" - 48"	2961

5700-SB-S	
0" - 6"	356
6" - 12"	575
12" - 24"	19300
24" - 30"	32
30" - 36"	72
36" - 42"	717
42" - 48"	260

6510-SB-S	
24" - 30"	2830
30" - 36"	4320
36" - 42"	3800
42" - 48"	3970

5240-FP-S-H	
0" - 6"	4090
6" - 12"	4580
12" - 24"	9620
24" - 30"	314
30" - 36"	448
36" - 42"	379
42" - 48"	239

5600-OF-003	
0" - 6"	2810
6" - 12"	13300
12" - 24"	12600
24" - 30"	43
30" - 36"	654
36" - 42"	26
42" - 48"	90

6060-FP-N-INF	
0" - 6"	752
6" - 12"	964
12" - 24"	5260
24" - 30"	237
30" - 36"	77
36" - 42"	39
42" - 48"	30

6550-SB-S	
0" - 6"	6690
6" - 12"	5290
12" - 24"	5750

5210-OF-001	
0" - 6"	868
6" - 12"	2408
12" - 24"	10240
24" - 30"	2320
30" - 36"	3020
36" - 42"	4700
42" - 48"	1765

Legend

- Floodplain Sample
- Side Bed Sample
- Outfall Area Sample
- Area of Proposed Soil Remediation

NOTES: Units shown in µg/kg. Sample locations shown are approximate.

150 0 150 Feet

SANDERS CREEK
SUPPLEMENTAL SAMPLING
TOTAL PCBs
(APRIL, MAY, AND DECEMBER 2016)

AECOM

FIGURE 3.1

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SANDERS CREEK\SOIL ANALYTICAL RESULTS (APR-DEC 2016) PCB.mxd 3/7/2017

N

2900-FP-S-L	
0" - 6"	2705
6" - 12"	2510
12" - 24"	5820
24" - 30"	45
30" - 36"	45
36" - 42"	32
42" - 48"	273

3000-FP-N	
0" - 6"	2231
6" - 12"	6170
12" - 24"	6410
24" - 30"	2986
30" - 36"	643
36" - 42"	348
42" - 48"	1342

3600-FP-N	
0" - 6"	3483
6" - 12"	11770
12" - 24"	13100
24" - 30"	2660
30" - 36"	5070
36" - 42"	21800
42" - 48"	14600

3650-SB-N	
0" - 6"	9690
6" - 12"	22800
12" - 24"	16460
24" - 30"	23000
30" - 36"	10110
36" - 42"	10640
42" - 48"	6670

3825-SB-S	
0" - 6"	3167
6" - 12"	4610
12" - 24"	5750
24" - 30"	583
30" - 36"	245
36" - 42"	354
42" - 48"	27

3950-SB-S	
0" - 6"	1406
6" - 12"	6060
12" - 24"	10410
24" - 30"	9210
30" - 36"	17500
36" - 42"	7890
42" - 48"	111

4100-FP-S-L	
0" - 6"	1527
6" - 12"	5670
12" - 24"	11100
24" - 30"	6020
30" - 36"	629
36" - 42"	378
42" - 48"	1870

4725-SB-N	
0" - 6"	13470
6" - 12"	15170
12" - 24"	11170
24" - 30"	9110
30" - 36"	4330
36" - 42"	3170
42" - 48"	10100

4725-SB-S	
0" - 6"	3109
6" - 12"	8730
12" - 24"	13270
24" - 30"	11360
30" - 36"	363
36" - 42"	458
42" - 48"	558

4800-SB-N	
0" - 6"	3398
6" - 12"	5910
12" - 18"	4700
18" - 24"	4120
24" - 30"	5510
30" - 36"	415
36" - 42"	160
42" - 48"	71

4810-FP-N-L	
0" - 6"	310
6" - 12"	314
12" - 18"	427
18" - 24"	337
24" - 30"	2920
30" - 36"	1430
36" - 42"	2888
42" - 48"	1217

4820-SB-N	
0" - 6"	765
6" - 12"	574
12" - 18"	187
18" - 24"	202
24" - 30"	1630
30" - 36"	2236
36" - 42"	295
42" - 48"	191

4810-SB-N	
0" - 6"	6280
6" - 12"	4890
12" - 24"	57200
24" - 30"	16740
30" - 36"	9210
36" - 42"	20560
42" - 48"	4240

Legend

- Floodplain Sample
- Side Bed Sample
- Outfall Area Sample
- Area of Proposed Soil Remediation

NOTES: Units shown in µg/kg. Sample locations shown are approximate.

150 0 150 Feet

SANDERS CREEK SUPPLEMENTAL SAMPLING TOTAL PCBs (APRIL, MAY, AND DECEMBER 2016)

AECOM

FIGURE 3.2

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SANDERS CREEK\SOIL ANALYTICAL RESULTS (APR-DEC 2016) PCB.mxd 3/7/2017

N

0590-FP-N	
0" - 6"	2613
6" - 12"	3307
12" - 24"	5750
24" - 30"	2735
30" - 36"	4250
36" - 42"	142
42" - 48"	525

Legend

- Floodplain Sample
- Side Bed Sample
- Outfall Area Sample
- Area of Proposed Soil Remediation

NOTES: Units shown in µg/kg. Sample locations shown are approximate.

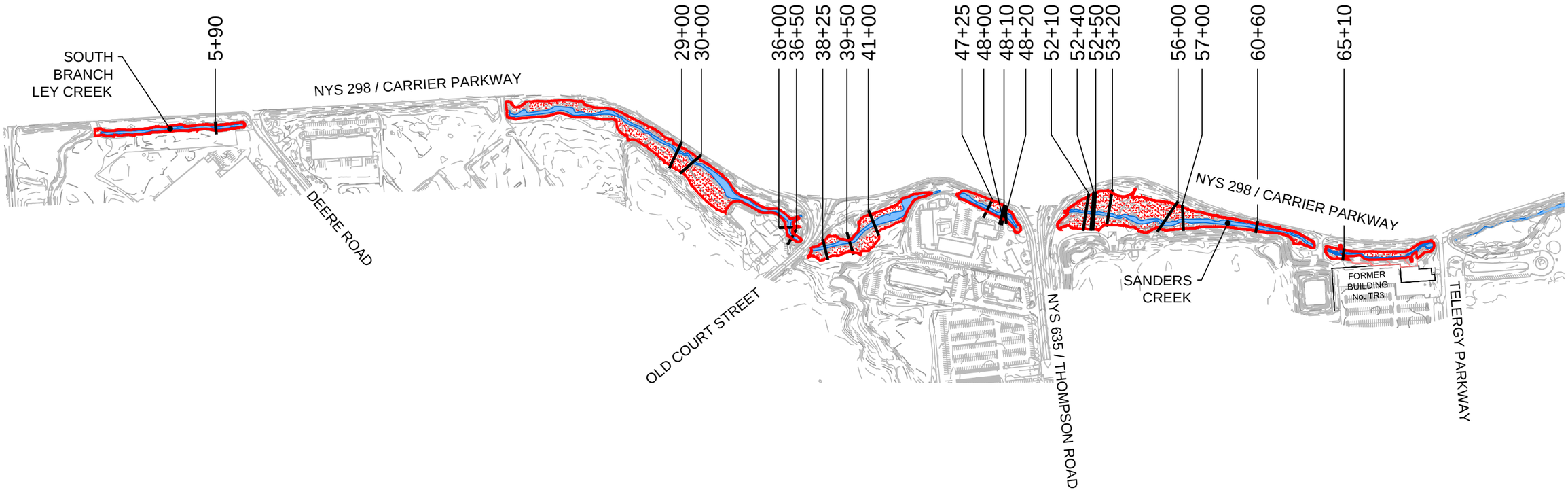
150 0 150 Feet

SANDERS CREEK
SUPPLEMENTAL SAMPLING
TOTAL PCBs
(APRIL, MAY, AND DECEMBER 2016)

AECOM

FIGURE 3.3

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SANDERS CREEK\SOIL ANALYTICAL RESULTS (APR-DEC 2016) PCB.mxd 3/7/2017



LEGEND

SANDERS CREEK
PROPOSED AREA OF SOIL REMEDIATION

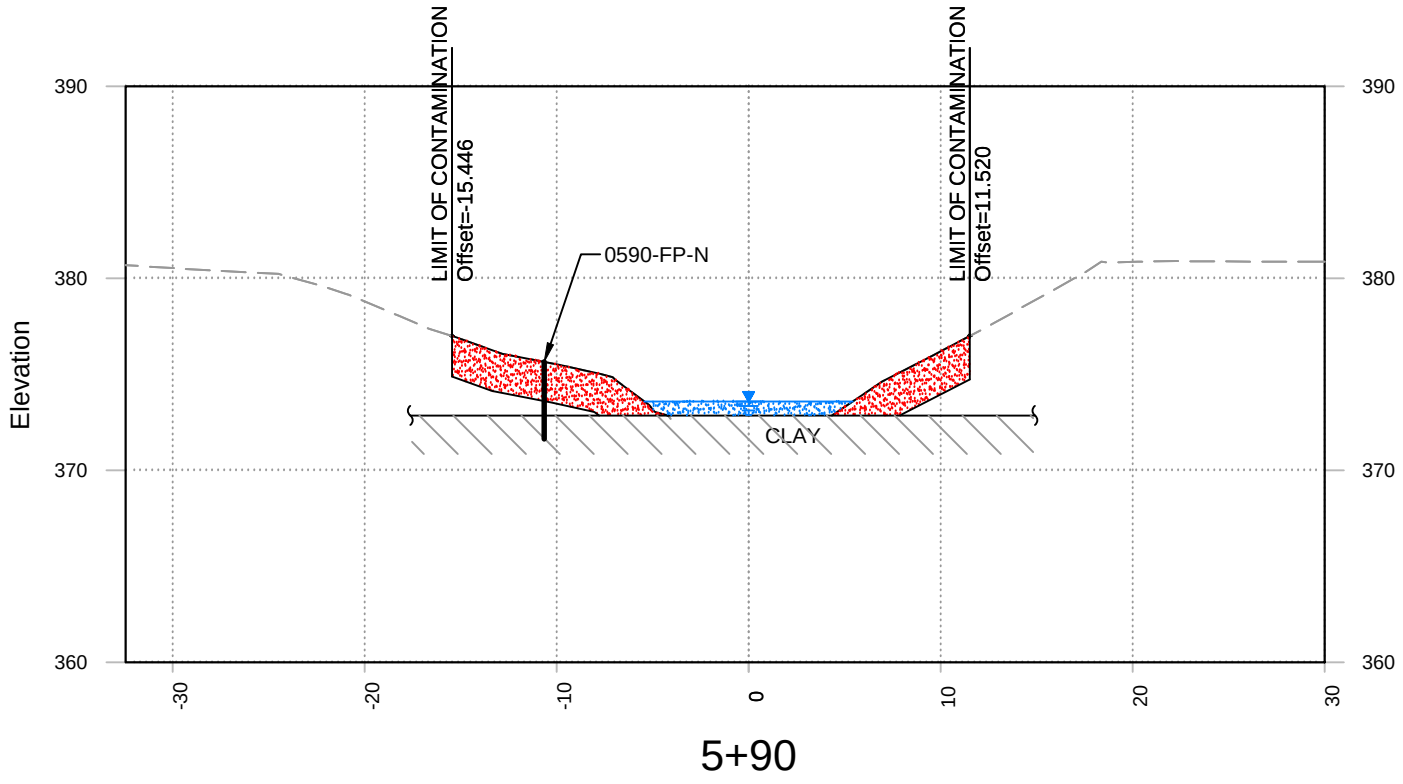
MAPPING REFERENCE: MAPPING INFORMATION SHOWN FROM AN AERIAL SURVEY PERFORMED BY THEW ASSOC., NOVEMBER 2013.

0' 250' 500' 1000'

SANDERS CREEK UTC/CARRIER SITE
SUPPLEMENTAL SAMPLING
CROSS SECTION PLAN
(FEBRUARY 7, 2017)

AECOM

FIGURE 4.0



5+90

LEGEND:

	2 FOOT CUT
3650-SB-N	PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
3650-SB-N	PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
	WATER SURFACE ELEVATION

BASED ON NOVEMBER 2013 AERIAL SURVEY.

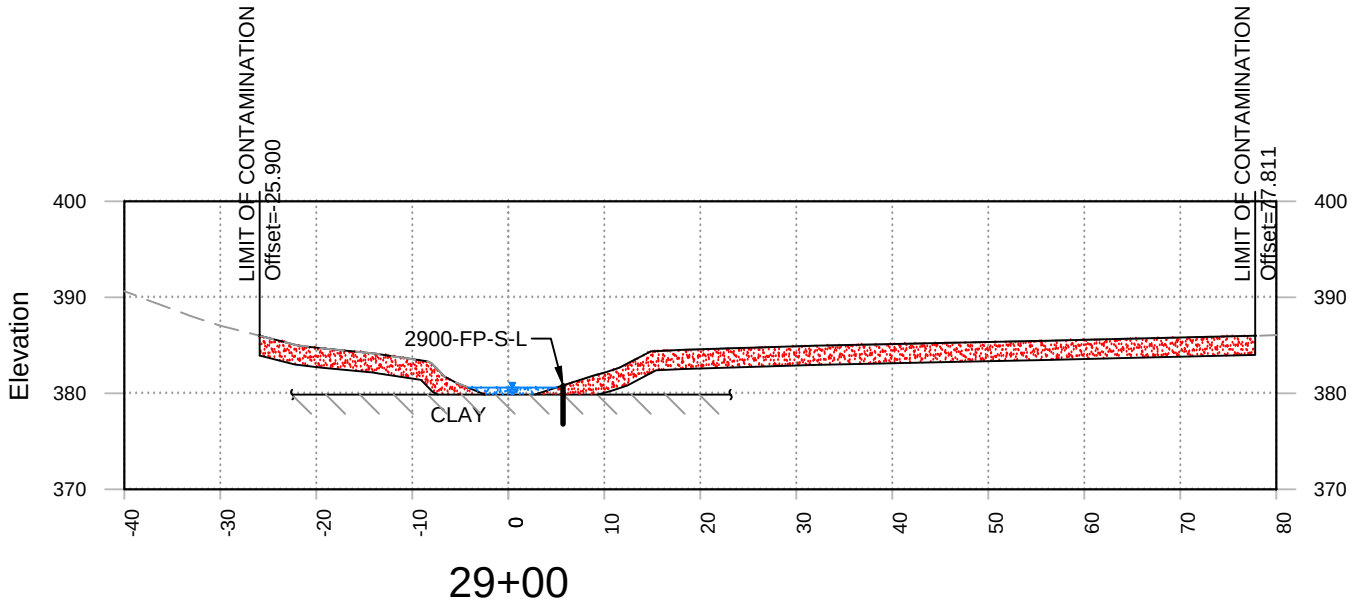
10' 0 10'

SCALE IN FEET

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 5+90

FIGURE 4.1



29+00

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

20' 0 20'

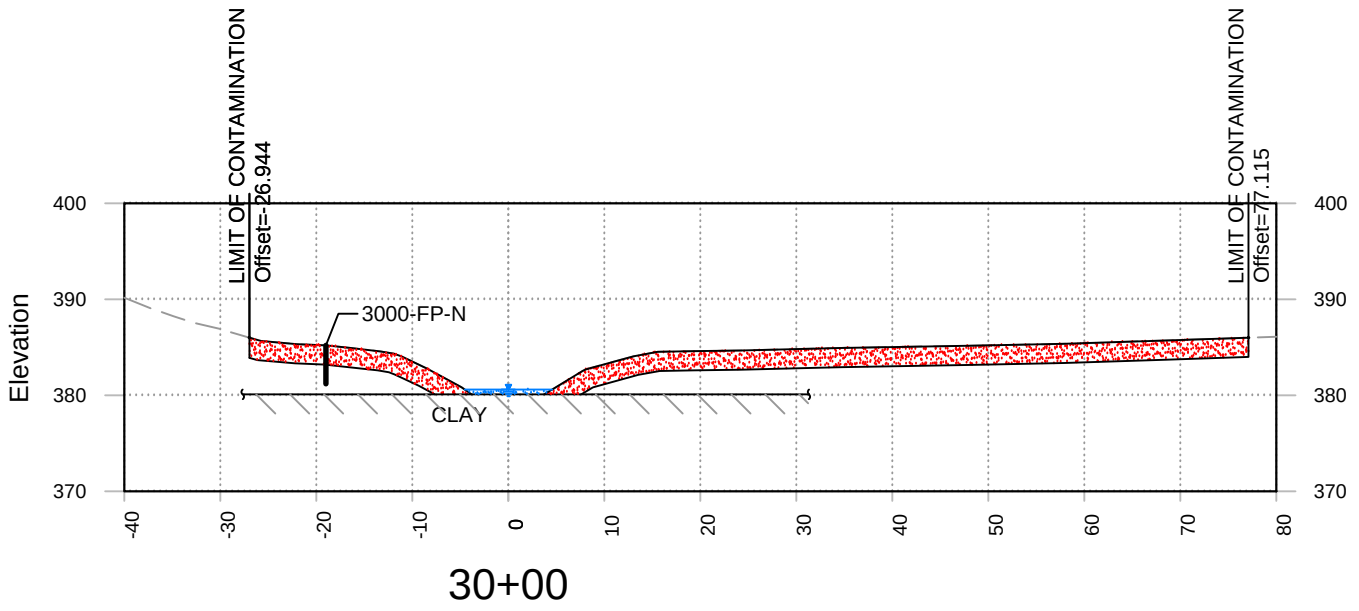
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 29+00

FIGURE 4.2



30+00

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

BASED ON NOVEMBER 2013 AERIAL SURVEY.

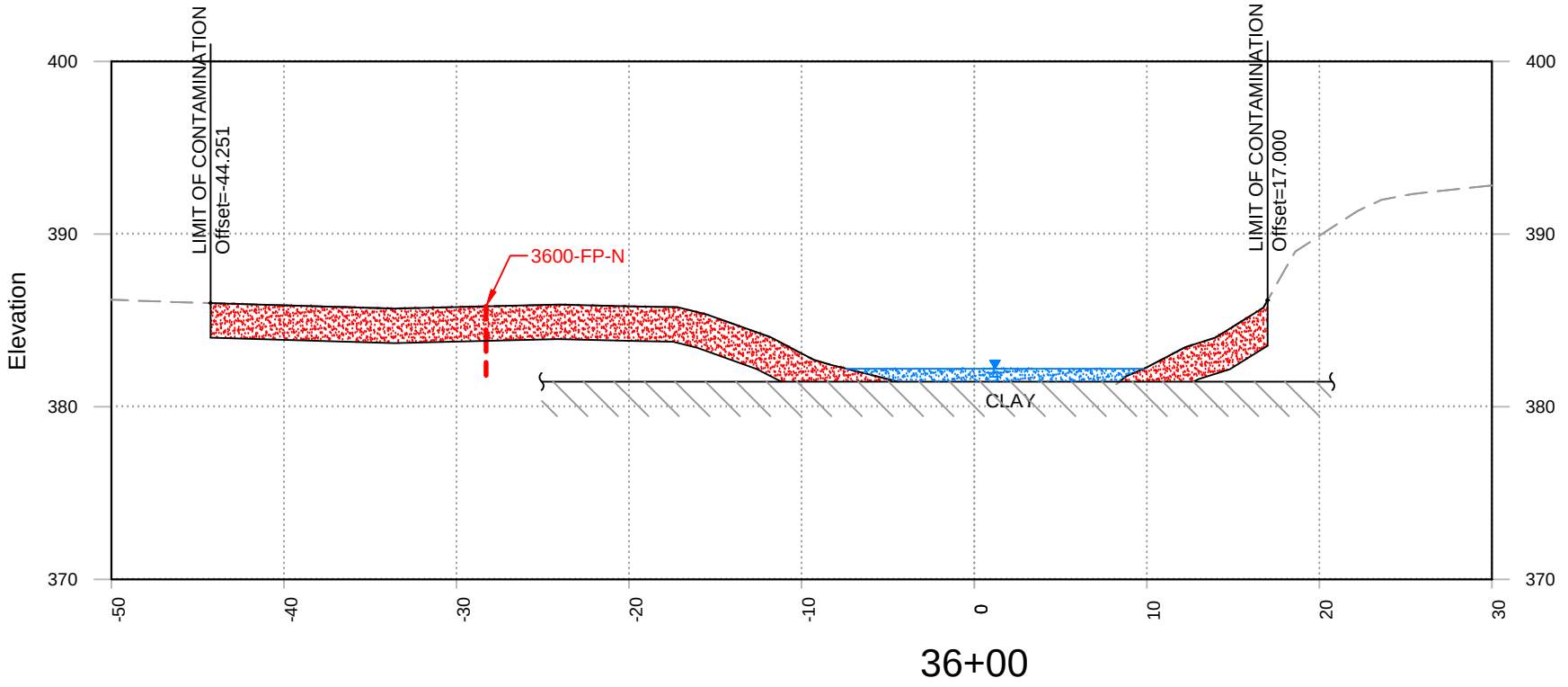
20' 0 20'

SCALE IN FEET

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 30+00

FIGURE 4.3



LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

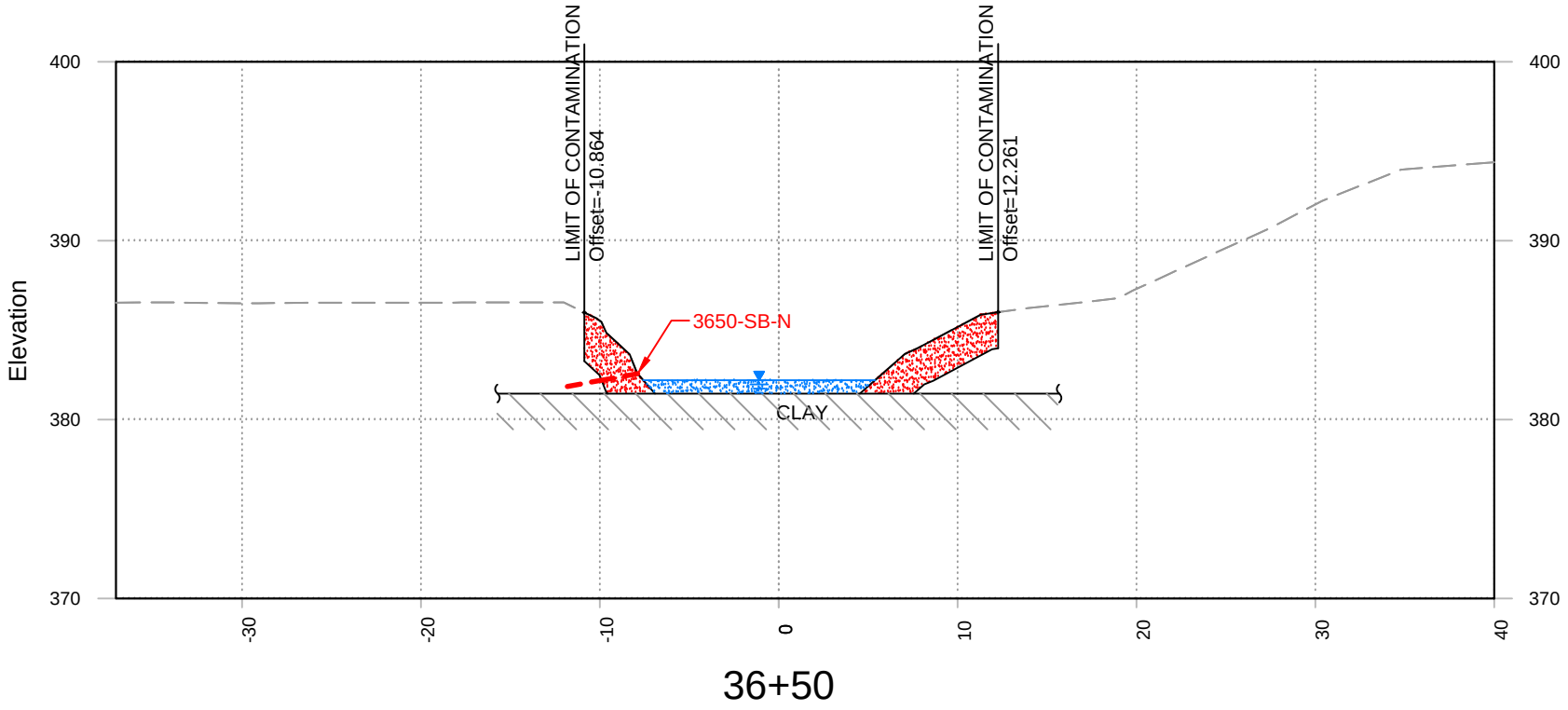
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 36+00

FIGURE 4.4



36+50

LEGEND:

2 FOOT CUT

3650-SB-N PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER

3650-SB-N PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER

WATER SURFACE ELEVATION

10' 0 10'

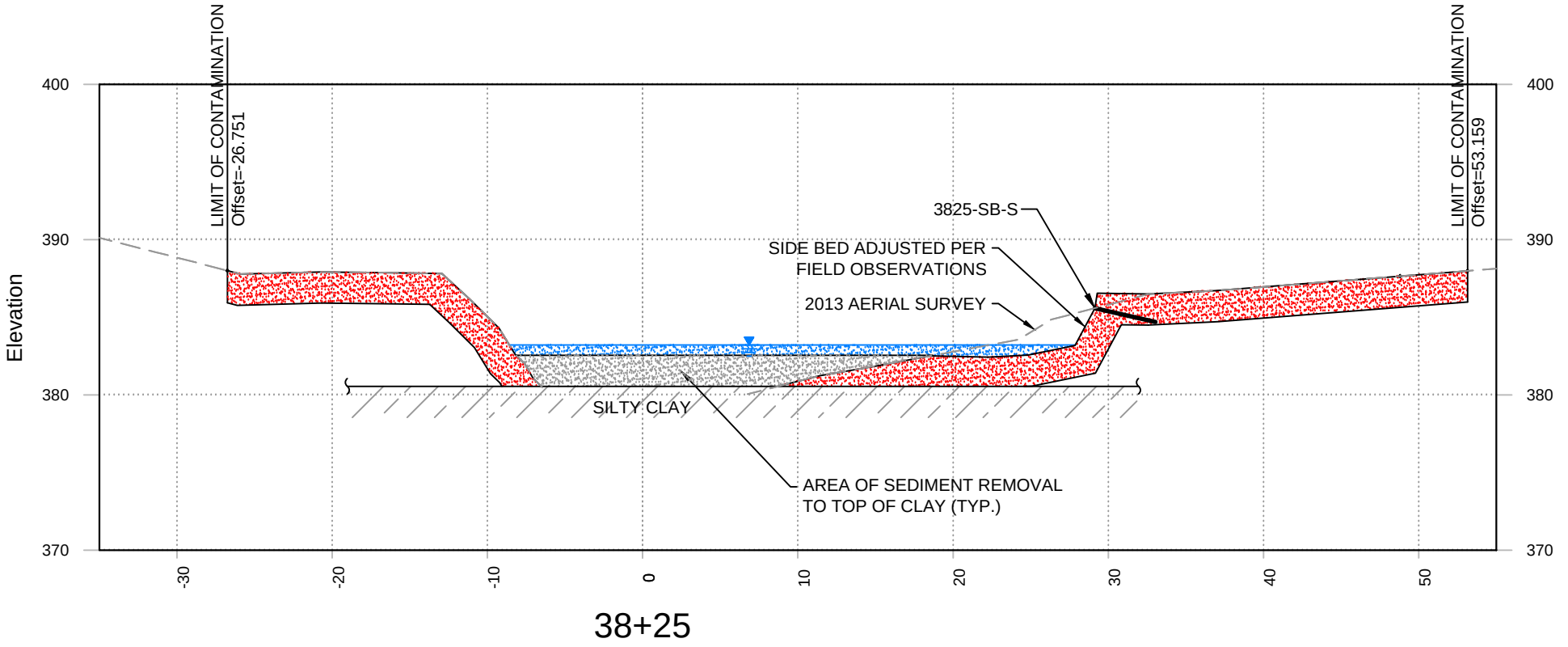
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 36+50

FIGURE 4.5



38+25

LEGEND:

- 2 FOOT CUT
- 3650-SB-N PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

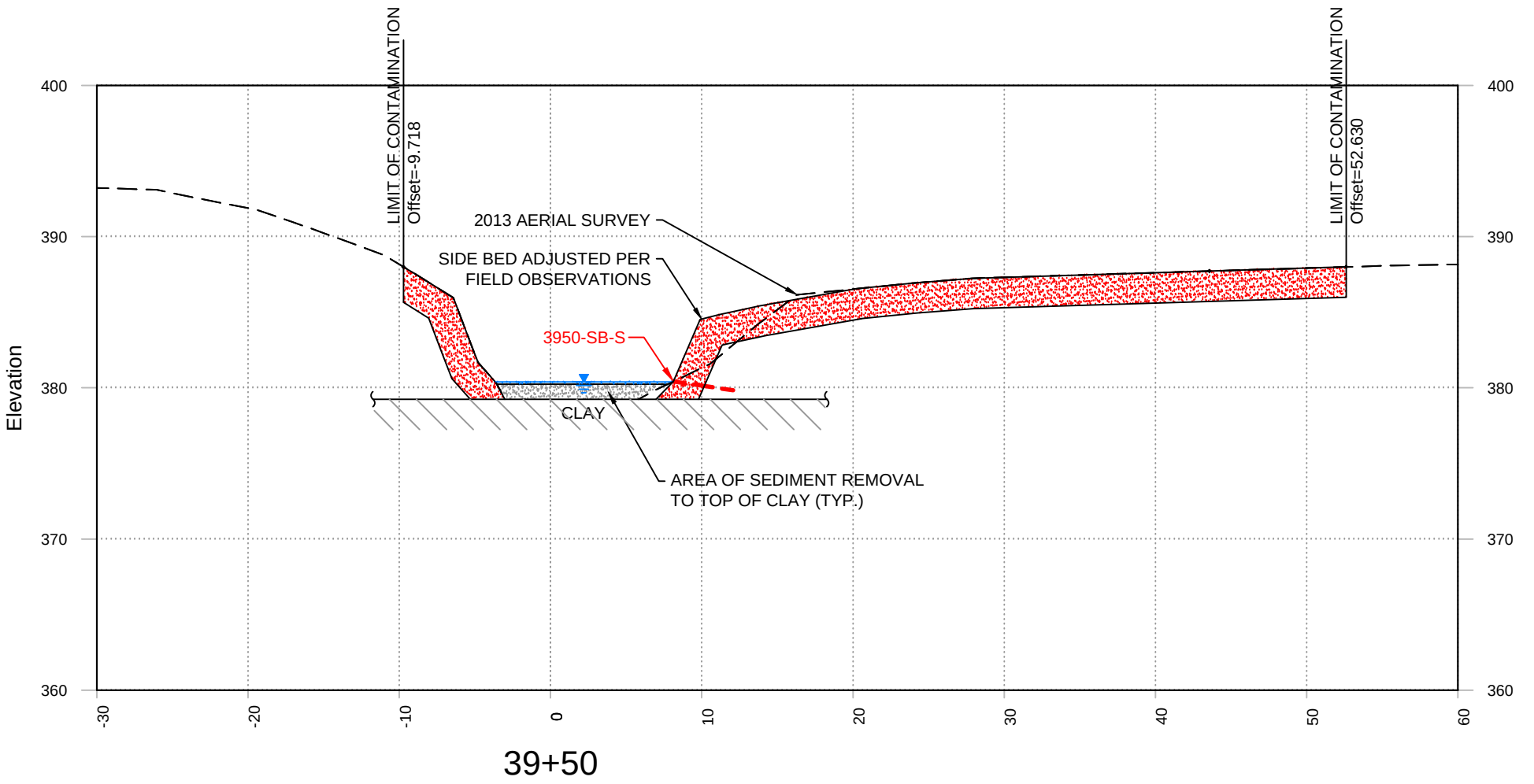
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 38+25

FIGURE 4.6



39+50

LEGEND:

- 2 FOOT CUT
- 3650-SB-N PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

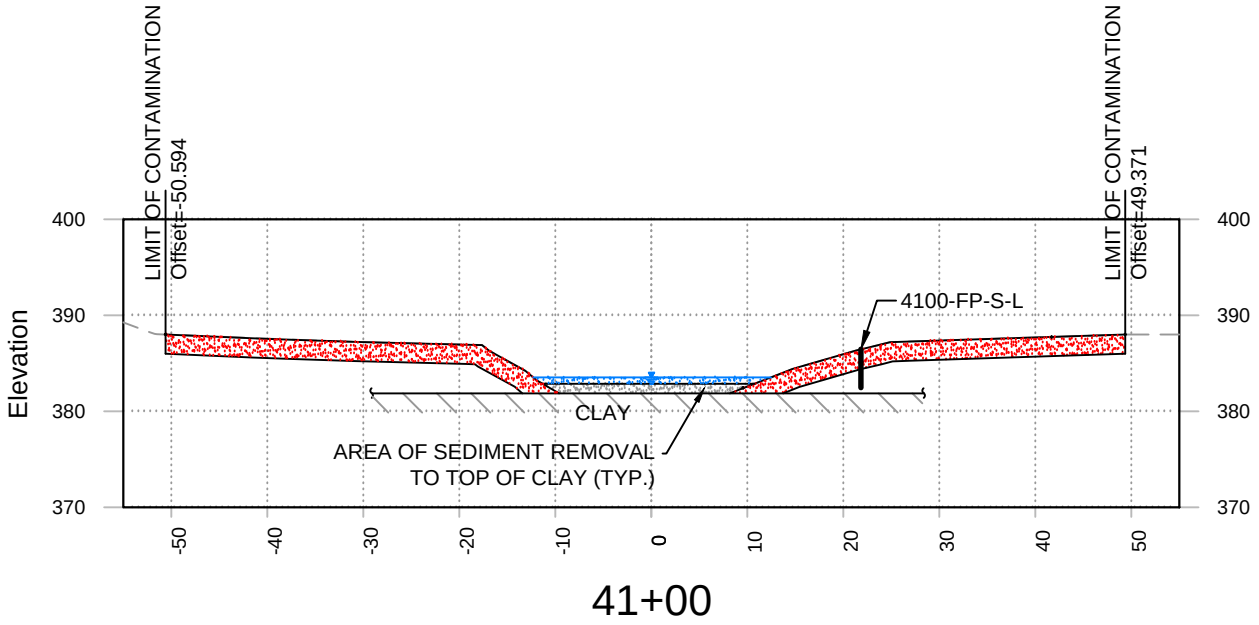
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 39+50

FIGURE 4.7



41+00

LEGEND:

2 FOOT CUT

3650-SB-N PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER

3650-SB-N PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER

WATER SURFACE ELEVATION

20' 0 20'

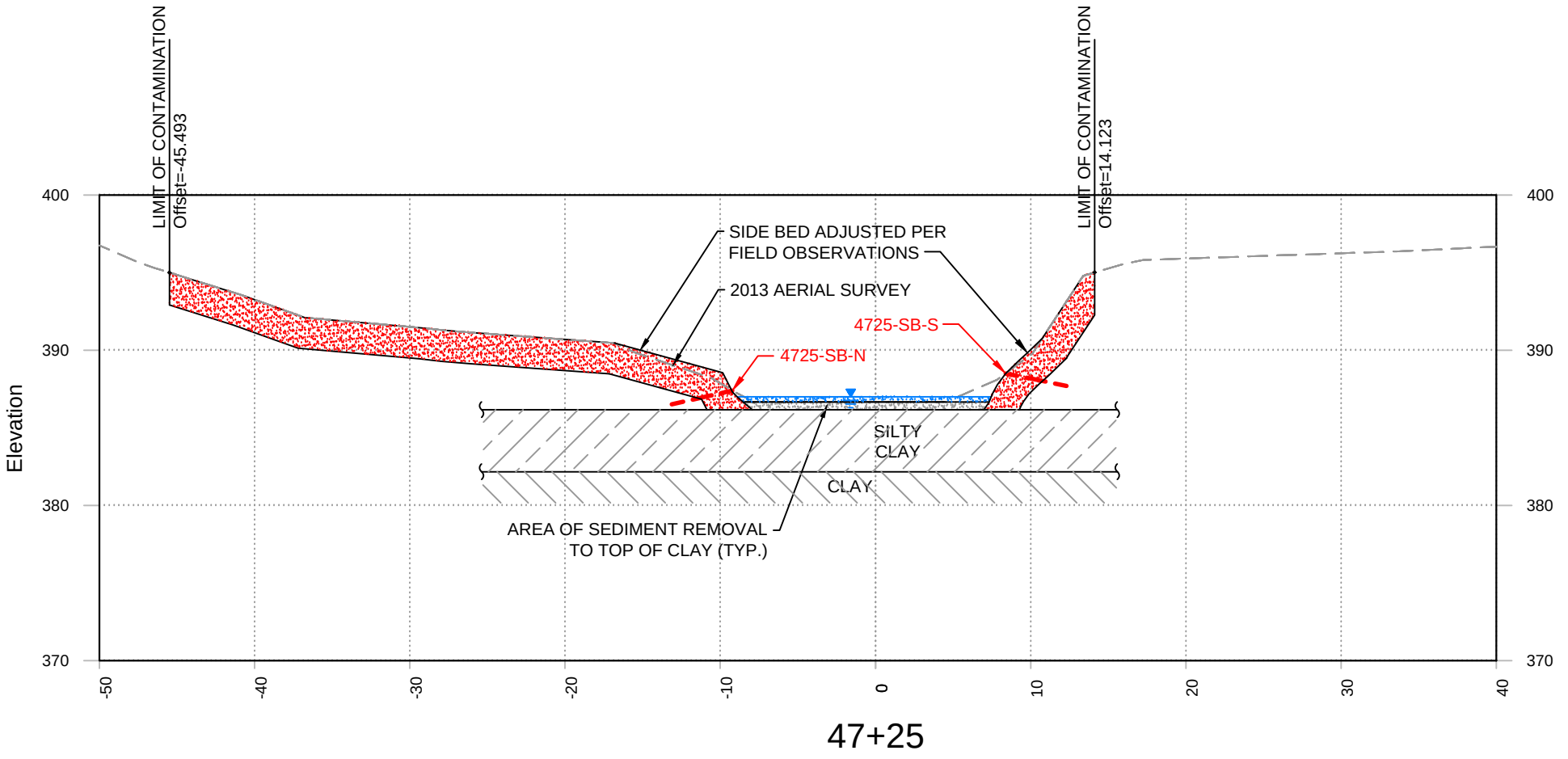
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 41+00

FIGURE 4.8



47+25

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

BASED ON NOVEMBER 2013 AERIAL SURVEY.

LOCATED BY ORIENTATION TO BANK, NOT SURVEYED LOCATION.

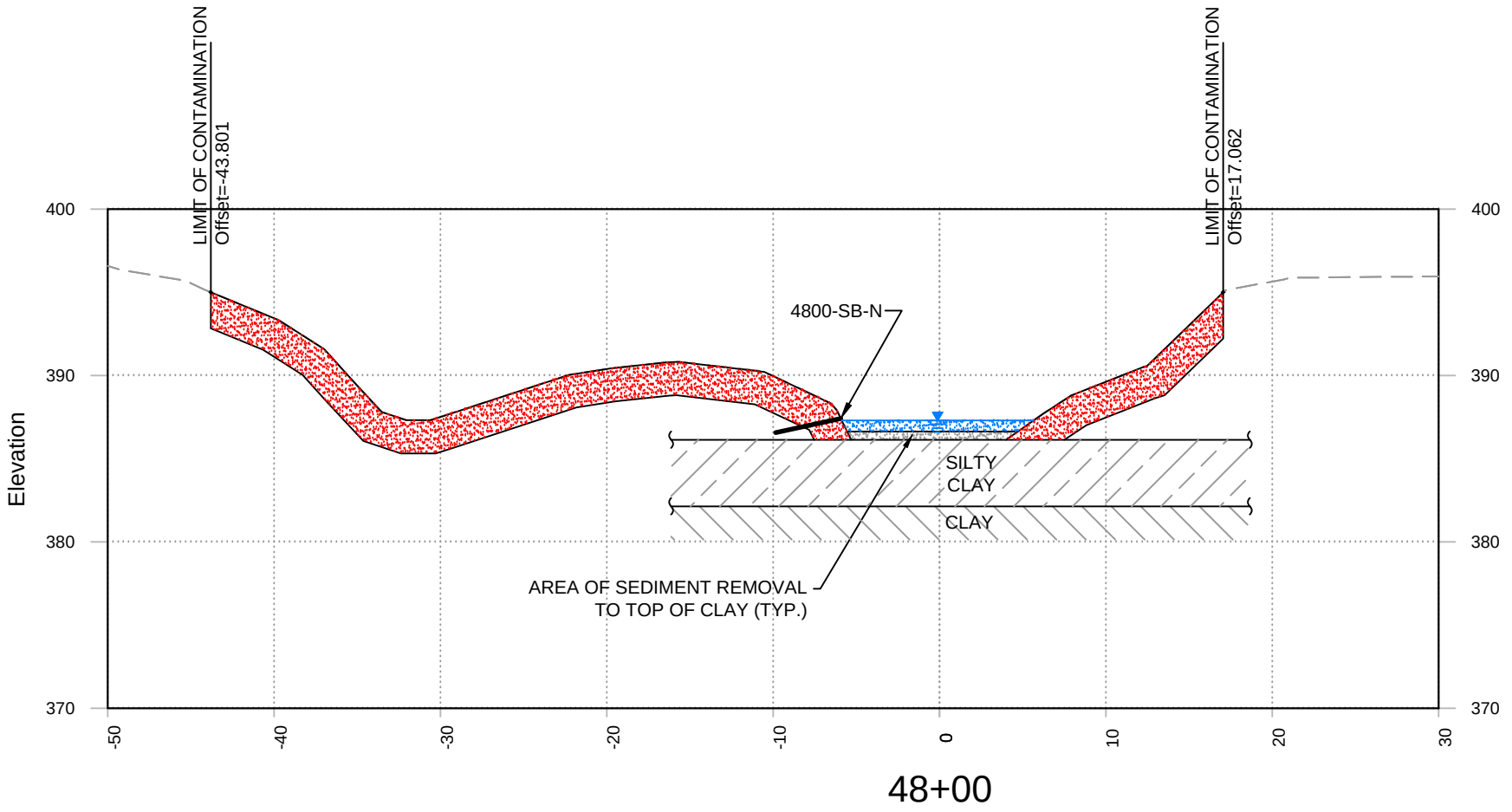
10' 0 10'

SCALE IN FEET

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 47+25

FIGURE 4.9



48+00

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

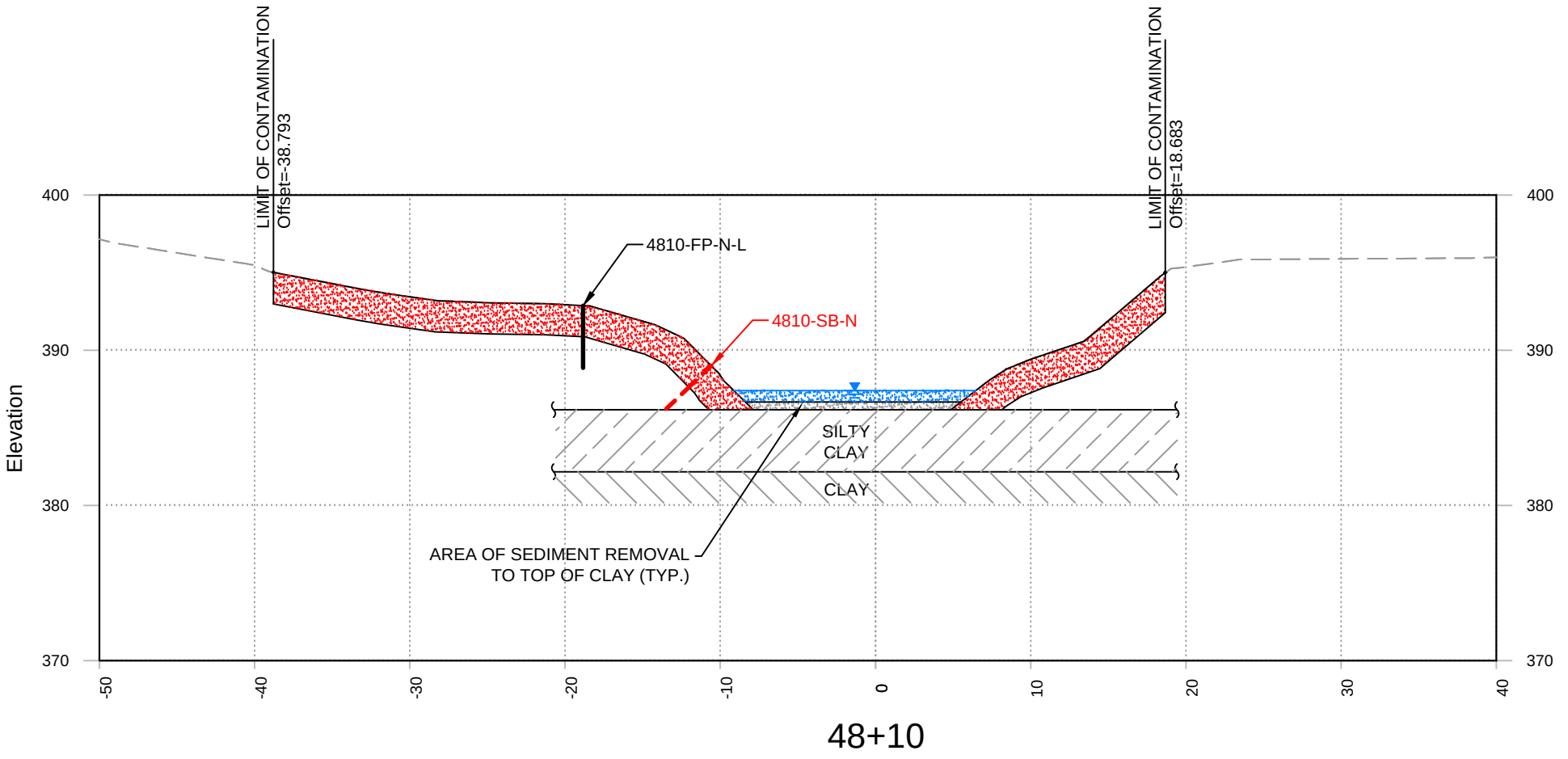
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 48+00

FIGURE 4.10



48+10

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

LOCATED BY ORIENTATION TO BANK, NOT SURVEYED LOCATION.

10' 0 10'

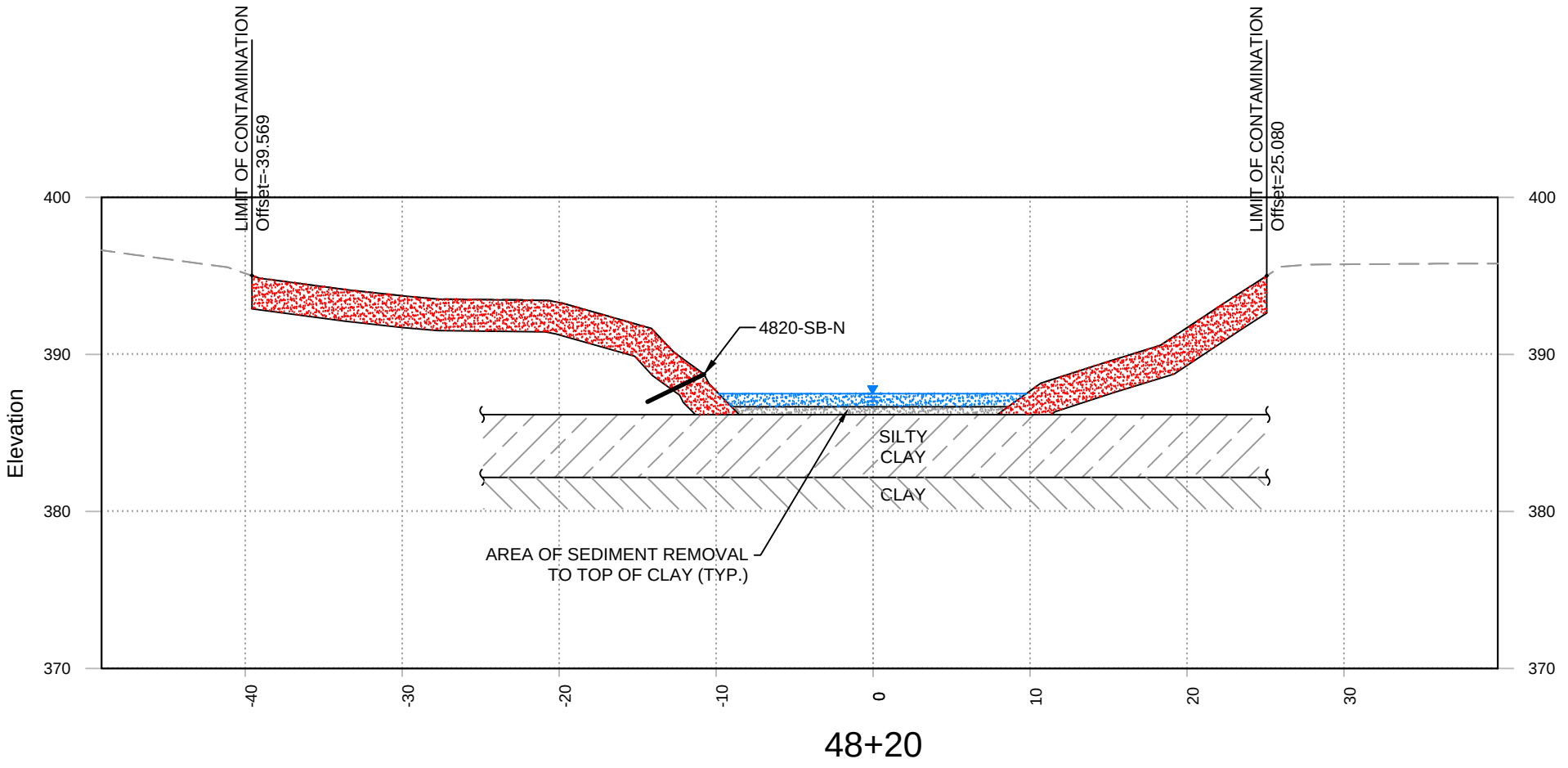
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 48+10

FIGURE 4.11



48+20

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

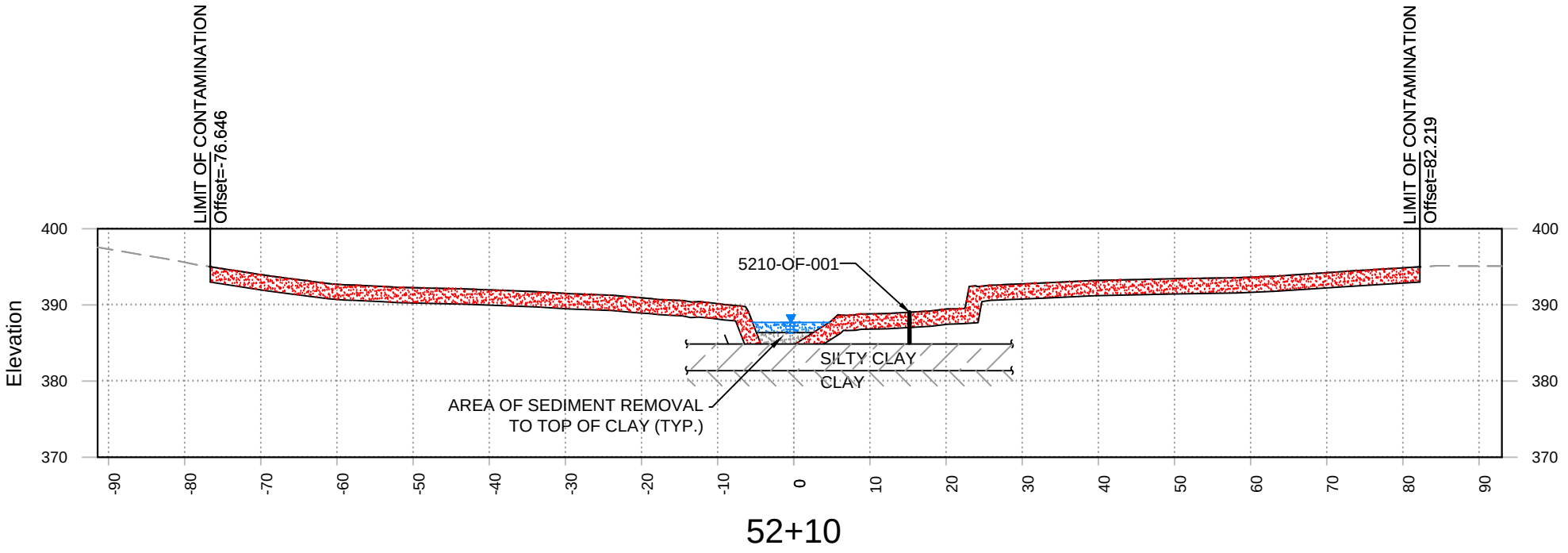
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 48+20

FIGURE 4.12



52+10

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

20' 0 20'

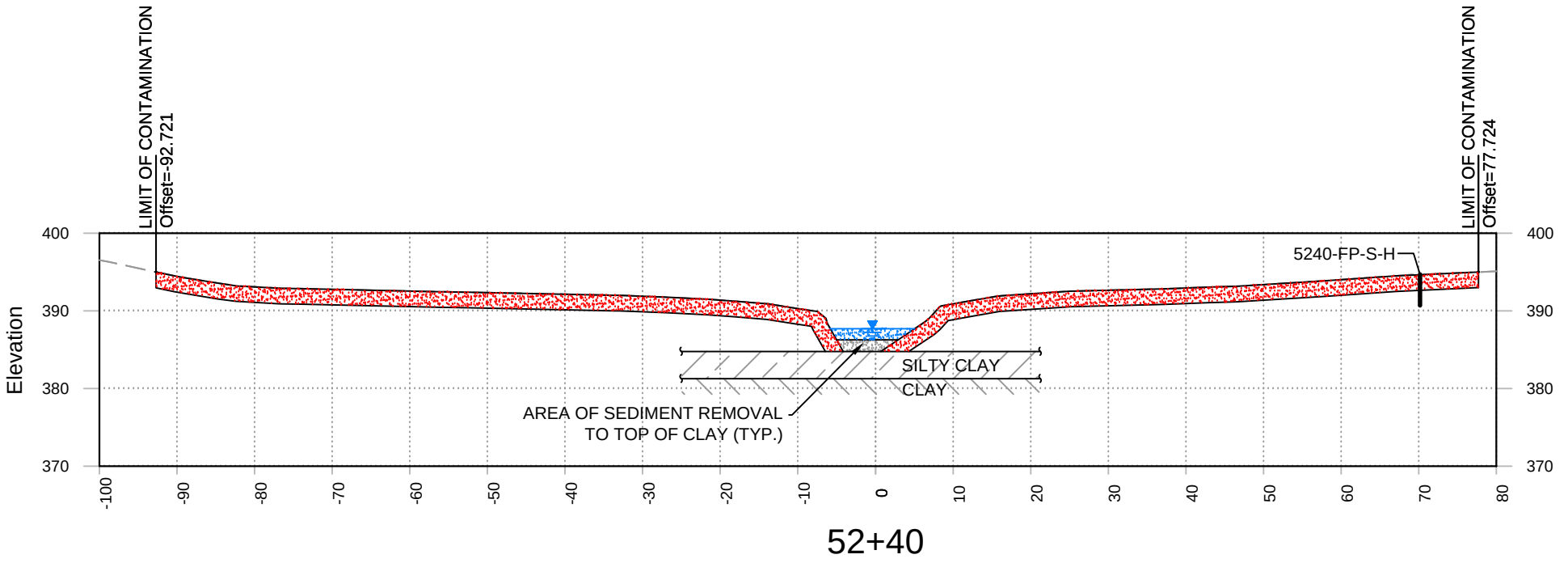
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 52+10

FIGURE 4.13



52+40

LEGEND:

2 FOOT CUT

3650-SB-N PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER

3650-SB-N PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER

WATER SURFACE ELEVATION

20' 0 20'

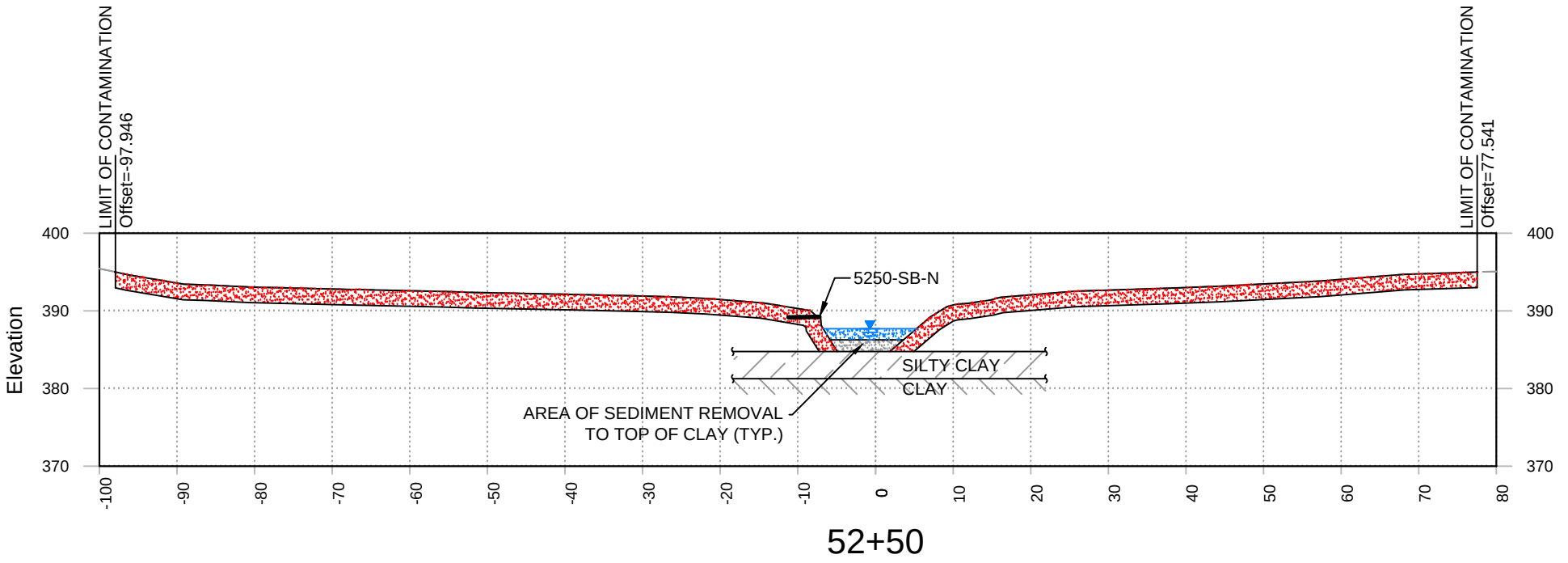
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 52+40

FIGURE 4.14



52+50

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

20' 0 20'

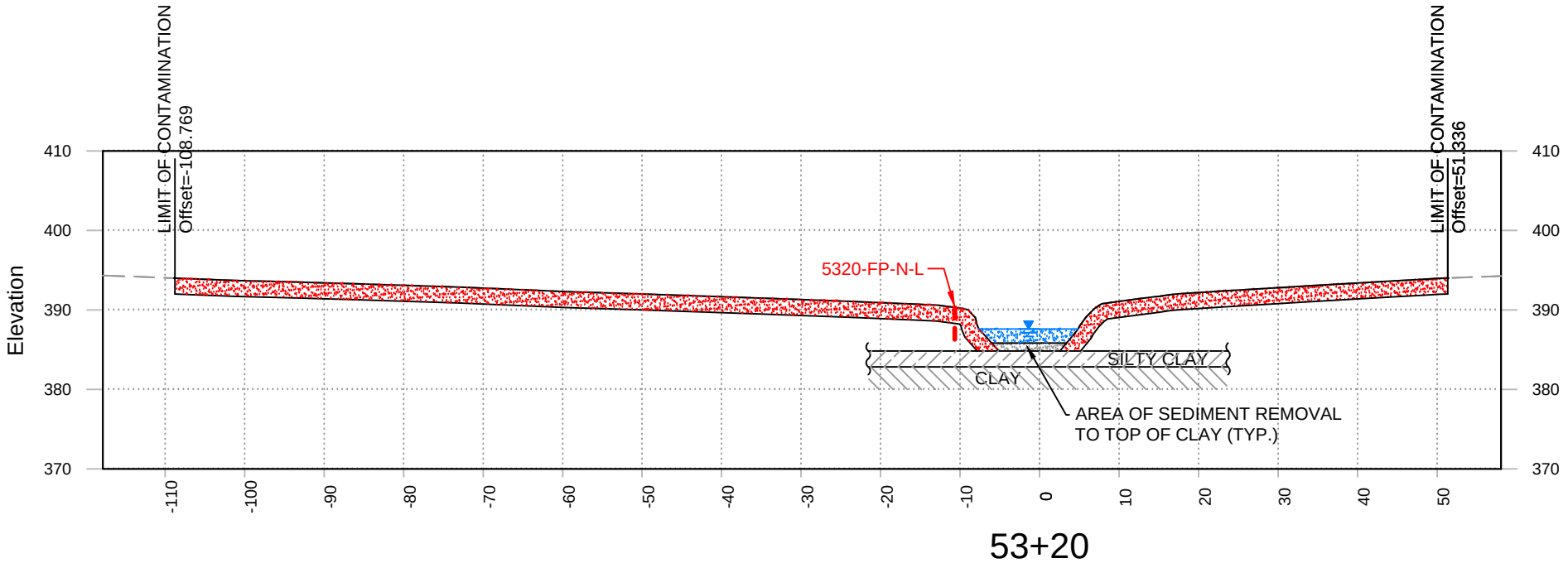
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 52+50

FIGURE 4.15



53+20

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

BASED ON NOVEMBER 2013 AERIAL SURVEY.

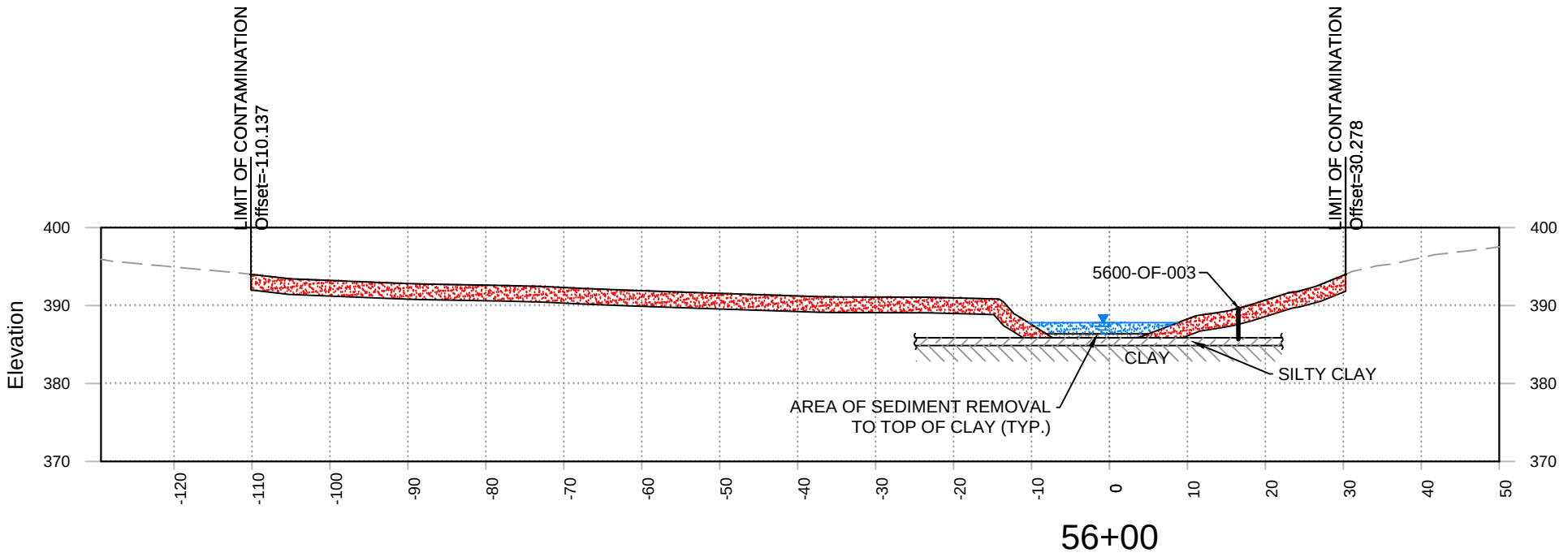
20' 0 20'

SCALE IN FEET

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 53+20

FIGURE 4.16



56+00

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

20' 0 20'

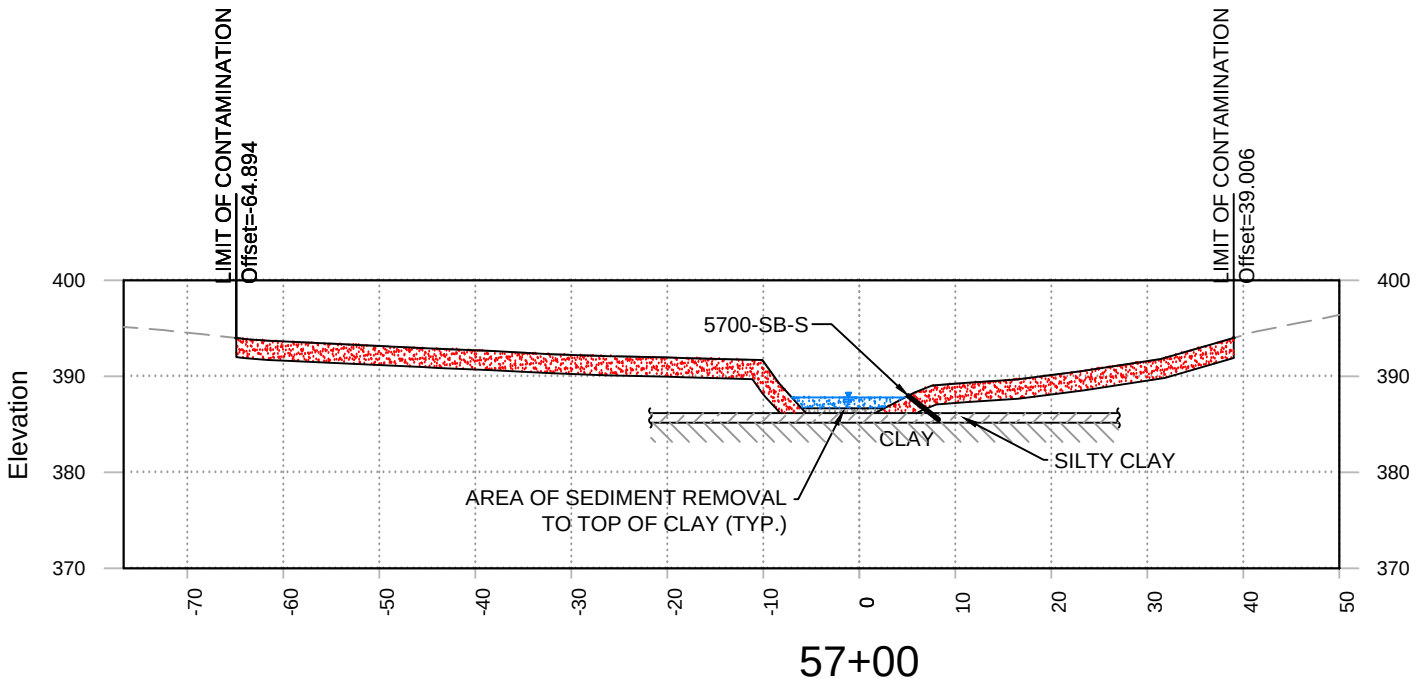
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 56+00

FIGURE 4.17



57+00

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

20' 0 20'

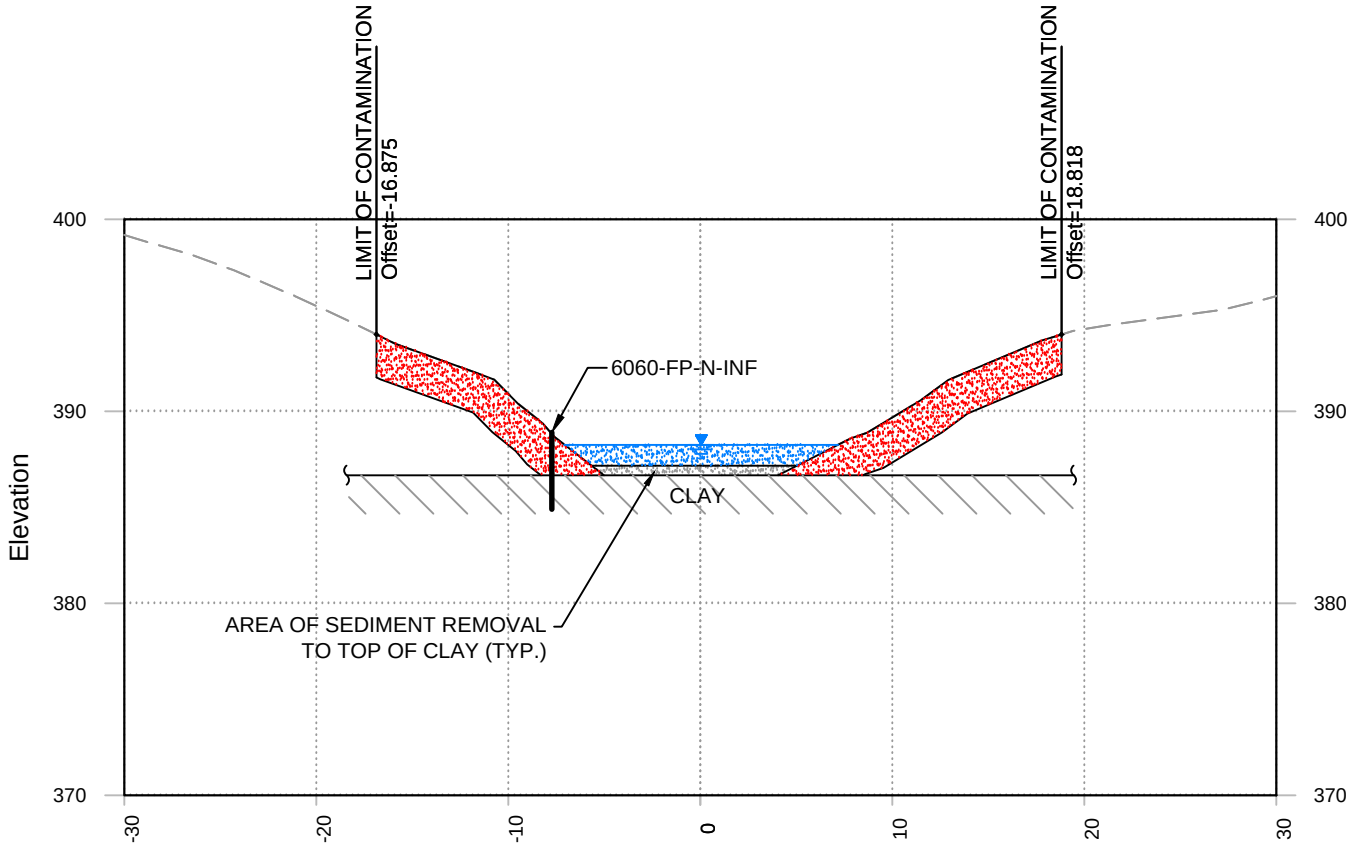
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 57+00

FIGURE 4.18



60+60

LEGEND:

- 2 FOOT CUT
- 3650-SB-N — PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N — PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

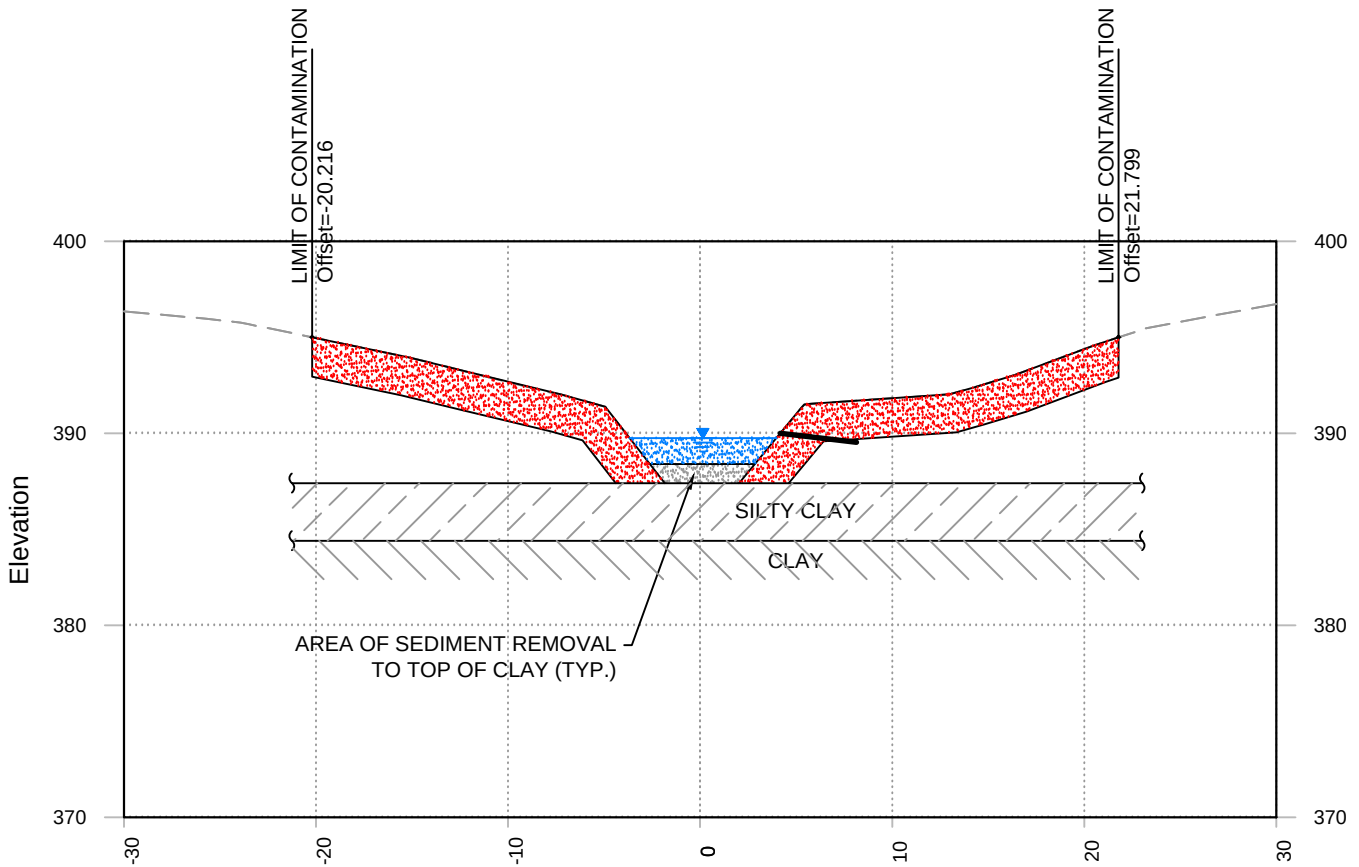
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 60+60

FIGURE 4.19



65+10

LEGEND:

- 2 FOOT CUT
- 3650-SB-N PCB RESULTS < 10,000 ug/kg @ 2 FT OR DEEPER
- 3650-SB-N PCB RESULTS > 10,000 ug/kg @ 2 FT OR DEEPER
- WATER SURFACE ELEVATION

10' 0 10'

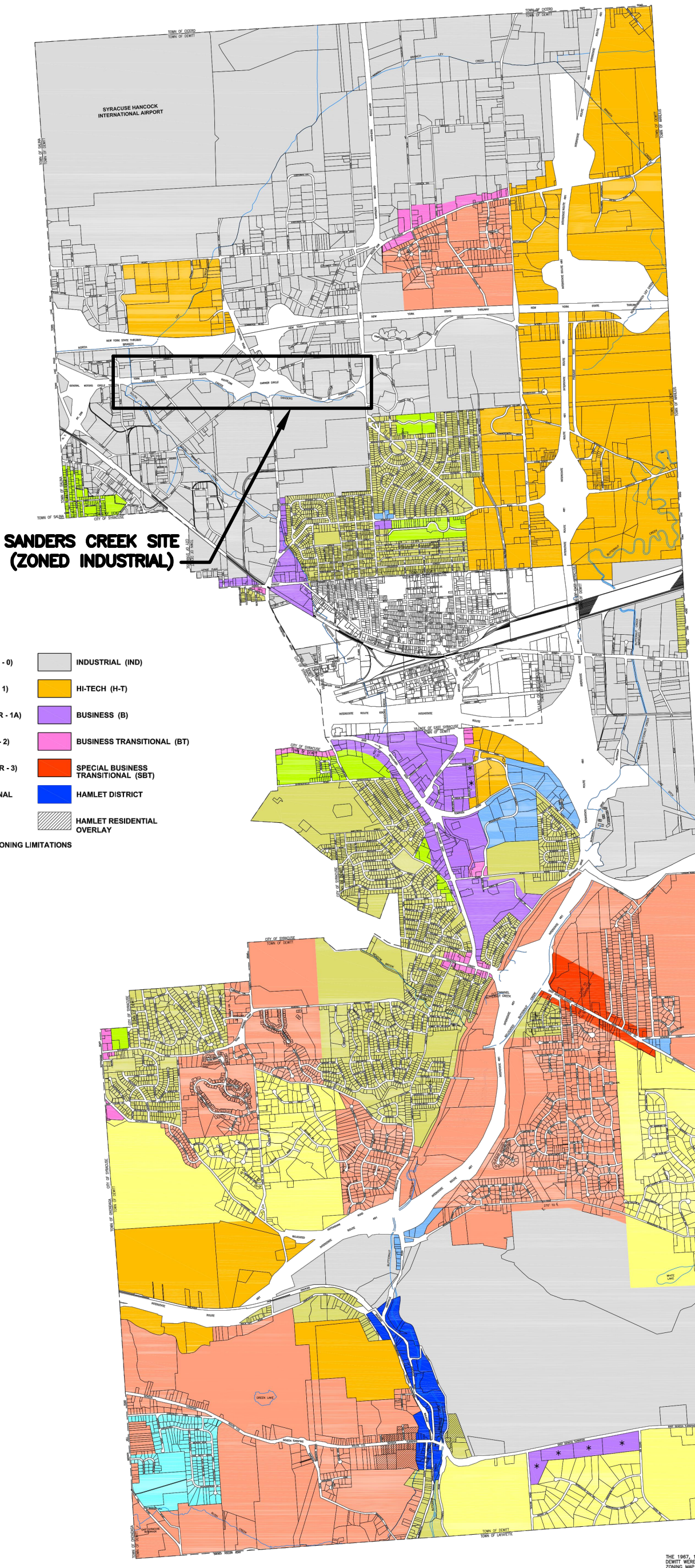
SCALE IN FEET

BASED ON NOVEMBER 2013 AERIAL SURVEY.

AECOM

SANDERS CREEK
SAMPLING CROSS SECTION STA. 65+10

FIGURE 4.20



TOWN OF DEWITT, N.Y.
ZONING MAP 2008

THE 1967, 1984, 1989 AND 2002 ZONING MAPS OF TOWN OF DEWITT WERE AMENDED AND SUPPLANTED BY THE 2008 ZONING MAP OF THE TOWN OF DEWITT AS ADOPTED BY LOCAL LAW #3 OF 2008 ON JUNE 9, 2008 WHICH TOGETHER WITH THE TAX MAPS PERTAINING THERETO WILL NOW BE CALLED THE 2008 ZONING MAP OF THE TOWN OF DEWITT AND MAY BE RELIED UPON PURSUANT TO TOWN OF DEWITT RULES OF ZONING, CHAPTER 192.

SUPERVISOR

ATTESTED ..... TOWN CLERK

ALL CHANGES THROUGH JUNE 2008, AS AMENDED.

REVISIONS:
1) LOCAL LAW #9 OF 2008, SEPTEMBER 8, 2008, HAMLET DISTRICT AND HAMLET RESIDENTIAL OVERLAY.

PREPARED FOR TOWN OF DEWITT
DEPARTMENT OF DEVELOPMENT AND OPERATIONS
BY:

O'BRIEN & GERE ENGINEERS INC.

AECOM

TOWN OF DEWITT
ZONING MAP

FIGURE 5

Appendix A
Data Usability Summary Report Narrative
(DUSR attachments are available on request)

Prepared For:
United Technologies Corp.
Shared Remediation Services
Farmington, CT

Prepared by:
AECOM
Buffalo, NY
60438251

March 2017

SANDERS CREEK

UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY

Sampling and Analysis Report

Appendix A Data Usability Summary Report

Corrective Action Order - Index CO 7-20051118-4

NYSDEC Site Registry #734043

SANDERS CREEK
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY

Sampling and Analysis Report

Appendix A Data Usability Summary Report

Corrective Action Order - Index CO 7-20051118-4
NYSDEC Site Registry #734043

Prepared for:

United Technologies

UTC Shared Remediation Services
9 Farm Springs Road
Farmington, Connecticut 06032

Prepared By:

AECOM USA, Inc.
257 West Genesee Street, Suite 400
Buffalo, New York 14202

TABLE OF CONTENTS

TABLES

(Following Text)

ATTACHMENTS

I. INTRODUCTION

This Data Usability Summary Report (DUSR) has been prepared following the guidelines provided in New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation *DER-10 Technical Guidance for Site Investigation and Remediation*, Appendix 2B - *Guidance for Data Deliverables and the Development of Data Usability Summary Reports,* May 2010.

II. ANALYTICAL METHODOLOGIES AND DATA VALIDATION PROCEDURES

The data being evaluated are from the December 16-21, 2016 sampling of 100 soil samples, 5 field duplicates, 5 Matrix Spike/Matrix Spike Duplicate (MS/MSD) pairs, and 4 equipment rinsate blanks. All samples were sent to SGS Accutest located in Marlborough, MA and were analyzed for the following parameter.

Parameters	Methods
TCL Polychlorinated Biphenyls (PCBs)	USEPA 8082A

The laboratory was instructed to extract/hold the analysis of some of the PCB aliquots of the samples pending the results of the other samples. The laboratory was eventually instructed to analyze those held samples.

A limited data validation was performed in accordance with the guidelines in the following USEPA Region II document:

- *Polychlorinated Biphenyl (PCB) Aroclor Data Validation,* SOP HW-37, Rev. 3, May 2013

Qualifications applied to the data during the limited data validation include 'J' (estimated concentration). Definitions of USEPA data qualifiers are presented at the end of this text. The validated analytical results are presented on Tables 1 – 5. Copies of marked-up laboratory analytical summaries (Form 1s) are presented in Attachment A, on a per sample delivery group (SDG) basis. Documentation supporting the qualification of data is presented in Attachment B, on a per sample delivery group basis. Only analytical deviations affecting data usability are discussed in this report.

III. DATA DELIVERABLE COMPLETENESS

Full deliverable data packages (i.e., NYSDEC Category B or equivalent) were provided by the laboratory, which included all reporting forms and raw data necessary to fully evaluate and verify the reported analytical results.

IV. SAMPLE RECEIPT/PRESERVATION/HOLDING TIMES

All samples were received by the laboratory intact, properly preserved and under proper chain-of-custody (COC) with the following exception: A field blank was received with the samples collected on 12/16/2016 but not listed on the COC. All samples were analyzed within the required holding times (HT).

V. NON-CONFORMANCES

- **Chromatography**

  The laboratory noted in the case narrative that some samples exhibited interference due to multiple PCBs being present with overlapping peaks. The affected samples were noted on the Form 1s. Using professional judgement the data validator has qualified the affected aroclors 'J'.

  The percent differences (%Ds) between the dual-column analyses for the samples exceeded QC limits (>25%) but were less than 100%D for one or more PCBs. The PCB results for the affected samples have been qualified 'J' in accordance with the following validation guidelines.

% Difference	Qualifier
0-25%	none
26-100%	'J'
101-200% (interference detected)	'NJ'
>50% (value is < QL on both columns)	'U'
>200%	'R'

  Support documentation (i.e., GC Identification Summary forms) is provided in Attachment B.

- **Field Duplicates**

  Good field and analytical precision is defined as the following:

  1. If both the sample and field duplicate (FD) results are greater than 2X the reporting limit (RL), the relative percent difference (%RPD) between the two results must be less than 50%.
  2. If both the sample and FD results are less than 2X the RL, the absolute difference between the two results must be less than the RL.

  Results not meeting the criteria above resulted in both the sample and field duplicate being qualified 'J'.

Field duplicates were collected at the following sample locations and exhibited good field and analytical precision with any exceptions noted below:

Parent Sample ID	Field Duplicate ID	Parameters Qualified 'J' or 'UJ'
5600-OF-003-2-2.5	DUP-1	----
5250-SB-N-3-3.5	DUP-2	----
4725-SB-N-2.5-3	DUP-3	----
3600-FP-N-2.5-3	DUP-4	PCBs: AR1260
2900-FP-S-L-3-3.5	DUP-5	----

VI. SAMPLE RESULTS AND REPORTING

All quantitation/detection limits were reported in accordance with method requirements and were adjusted for sample volume, moisture content, and dilution factors. Results below the quantitation limits were qualified 'J' by the laboratory.

VII. SUMMARY

All sample analyses were found to be compliant with the method and validation criteria, except where previously noted. Those results qualified 'J' are considered conditionally usable. All other sample results are usable as reported. AECOM does not recommend the recollection of any samples at this time.

Prepared By: Ann Marie Kropovitch, Chemist **Date:** 2/23/17

Reviewed By: George E. Kisluk, Senior Chemist for **Date:** 2/23/17

DEFINITIONS OF USEPA DATA QUALIFIERS

U –	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J –	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
(J+) -	The result is an estimated quantity. The associated numerical value is biased high.
(J-) -	The result is an estimated quantity. The associated numerical value is biased low.
UJ –	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R –	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.
D –	The sample result was reported from a secondary dilution analysis.
NJ –	The analysis indicates the presence of an analyte that has been "tentatively identified' and the associated numerical value represents its approximate concentration.

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49186/MC49186R/MC49186T
SANDERS CREEK

Location ID		5600-OF-003	5600-OF-003	5600-OF-003	5600-OF-003	5600-OF-003
Sample ID		5600-OF-003-2-2.5	DUP-1	5600-OF-003-2.5-3	5600-OF-003-3-3.5	5600-OF-003-3.5-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0
Date Sampled		12/16/16	12/16/16	12/16/16	12/16/16	12/16/16
Parameter	Units		Field Duplicate (1-1)			
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	37 U	36 U	39 U	37 U	41 U
Aroclor 1221	UG/KG	37 U	36 U	39 U	37 U	41 U
Aroclor 1232	UG/KG	37 U	36 U	39 U	37 U	41 U
Aroclor 1242	UG/KG	37 U	36 U	39 U	37 U	41 U
Aroclor 1248	UG/KG	37 U	36 U	39 U	37 U	41 U
Aroclor 1254	UG/KG	37 U	36 U	272 J	37 U	25.6 J
Aroclor 1260	UG/KG	42.5	19.5 J	382	26.2 J	64.0
Total Polychlorinated Biphenyls	UG/KG	42.5	19.5 J	654 J	26.2 J	89.6 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49186/MC49186R/MC49186T
SANDERS CREEK

Location ID		6060-FP-N-INF	6060-FP-N-INF	6060-FP-N-INF	6060-FP-N-INF	6510-SB-S
Sample ID		6060-FP-N-INF-2-2.5	6060-FP-N-INF-2.5-3	6060-FP-N-INF-3-3.5	6060-FP-N-INF-3.5-4	6510-SB-S-2-2.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5
Date Sampled		12/16/16	12/16/16	12/16/16	12/16/16	12/16/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	42 U	40 U	40 U	38 U	49 U
Aroclor 1221	UG/KG	42 U	40 U	40 U	38 U	49 U
Aroclor 1232	UG/KG	42 U	40 U	40 U	38 U	49 U
Aroclor 1242	UG/KG	42 U	40 U	40 U	38 U	49 U
Aroclor 1248	UG/KG	42 U	40 U	40 U	38 U	49 U
Aroclor 1254	UG/KG	62.9 J	21.6 J	40 U	38 U	1,210 J
Aroclor 1260	UG/KG	174	55.1	38.9 J	29.5 J	1,620 D
Total Polychlorinated Biphenyls	UG/KG	236.9 J	76.7 J	38.9 J	29.5 J	2,830 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49186/MC49186R/MC49186T
SANDERS CREEK

Location ID		6510-SB-S	6510-SB-S	6510-SB-S
Sample ID		6510-SB-S-2.5-3	6510-SB-S-3-3.5	6510-SB-S-3.5-4
Matrix		Soil	Soil	Soil
Depth Interval (ft)		2.5-3.0	3.0-3.5	3.5-4.0
Date Sampled		12/16/16	12/16/16	12/16/16
Parameter	Units			
Polychlorinated Biphenyls				
Aroclor 1016	UG/KG	48 U	54 U	52 U
Aroclor 1221	UG/KG	48 U	54 U	52 U
Aroclor 1232	UG/KG	48 U	54 U	52 U
Aroclor 1242	UG/KG	48 U	54 U	52 U
Aroclor 1248	UG/KG	48 U	54 U	52 U
Aroclor 1254	UG/KG	1,410 J	1,540 J	1,300 J
Aroclor 1260	UG/KG	2,910 D	2,260 D	2,670 D
Total Polychlorinated Biphenyls	UG/KG	4,320 J	3,800 J	3,970 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49204/MC49204R/MC49204T
SANDERS CREEK

Location ID		0590-FP-N	0590-FP-N	0590-FP-N	0590-FP-N	5210-OF-001
Sample ID		0590-FP-N-2-2.5	0590-FP-N-2.5-3	0590-FP-N-3-3.5	0590-FP-N-3.5-4	5210-OF-001-2-2.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5
Date Sampled		12/19/16	12/19/16	12/19/16	12/19/16	12/19/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	42 U	42 U	42 U	42 U	45 U
Aroclor 1221	UG/KG	42 U	42 U	42 U	42 U	45 U
Aroclor 1232	UG/KG	42 U	42 U	42 U	42 U	45 U
Aroclor 1242	UG/KG	42 U	42 U	42 U	42 U	45 U
Aroclor 1248	UG/KG	42 U	42 U	42 U	42 U	45 U
Aroclor 1254	UG/KG	525 DJ	1,100 DJ	43.1 J	155 J	1,040 DJ
Aroclor 1260	UG/KG	2,210 D	3,150 D	99.1	370	1,280 D
Total Polychlorinated Biphenyls	UG/KG	2,735 J	4,250 J	142.2 J	525 J	2,320 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49204/MC49204R/MC49204T
SANDERS CREEK

Location ID		5210-OF-001	5210-OF-001	5210-OF-001	5240-FP-S-H	5240-FP-S-H
Sample ID		5210-OF-001-2.5-3	5210-OF-001-3-3.5	5210-OF-001-3.5-4	5240-FP-S-H-2-2.5	5240-FP-S-H-2.5-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0
Date Sampled		12/19/16	12/19/16	12/19/16	12/19/16	12/19/16
Parameter	**Units**					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	47 U	49 U	47 U	39 U	37 U
Aroclor 1221	UG/KG	47 U	49 U	47 U	39 U	37 U
Aroclor 1232	UG/KG	47 U	49 U	47 U	39 U	37 U
Aroclor 1242	UG/KG	47 U	49 U	47 U	39 U	37 U
Aroclor 1248	UG/KG	47 U	49 U	47 U	39 U	37 U
Aroclor 1254	UG/KG	1,100 DJ	1,970 DJ	765 DJ	39 U	37 U
Aroclor 1260	UG/KG	1,920 D	2,730 D	1,000 D	314	448
Total Polychlorinated Biphenyls	UG/KG	3,020 J	4,700 J	1,765 J	314	448

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49204/MC49204R/MC49204T
SANDERS CREEK

Location ID		5240-FP-S-H	5240-FP-S-H	5250-SB-N	5250-SB-N	5250-SB-N
Sample ID		5240-FP-S-H-3-3.5	5240-FP-S-H-3.5-4	5250-SB-N-2-2.5	5250-SB-N-2.5-3	5250-SB-N-3-3.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0	3.0-3.5
Date Sampled		12/19/16	12/19/16	12/19/16	12/19/16	12/19/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	41 U	54 U	51 U	47 U
Aroclor 1221	UG/KG	40 U	41 U	54 U	51 U	47 U
Aroclor 1232	UG/KG	40 U	41 U	54 U	51 U	47 U
Aroclor 1242	UG/KG	40 U	41 U	54 U	51 U	47 U
Aroclor 1248	UG/KG	40 U	41 U	54 U	51 U	47 U
Aroclor 1254	UG/KG	40 U	41 U	75.5 J	629 DJ	67.6 J
Aroclor 1260	UG/KG	379	239	349	2,370 D	168
Total Polychlorinated Biphenyls	UG/KG	379	239	424.5 J	2,999 J	235.6 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49204/MC49204R/MC49204T
SANDERS CREEK

Location ID		5250-SB-N	5250-SB-N	5320-FP-N-L	5320-FP-N-L	5320-FP-N-L
Sample ID		DUP-02	5250-SB-N-3.5-4	5320-FP-N-L-2-2.5	5320-FP-N-L-2.5-3	5320-FP-N-L-3-3.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0	3.0-3.5
Date Sampled		12/19/16	12/19/16	12/19/16	12/19/16	12/19/16
Parameter	Units	Field Duplicate (1-1)				
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	51 U	58 U	57 U	54 U	52 U
Aroclor 1221	UG/KG	51 U	58 U	57 U	54 U	52 U
Aroclor 1232	UG/KG	51 U	58 U	57 U	54 U	52 U
Aroclor 1242	UG/KG	51 U	58 U	57 U	54 U	52 U
Aroclor 1248	UG/KG	51 U	58 U	57 U	54 U	52 U
Aroclor 1254	UG/KG	93.8 J	34.1 J	6,220 DJ	10,800 DJ	2,160 DJ
Aroclor 1260	UG/KG	248	69.5	13,500 D	41,900 D	7,370 D
Total Polychlorinated Biphenyls	UG/KG	341.8 J	103.6 J	19,720 J	52,700 J	9,430 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49204/MC49204R/MC49204T
SANDERS CREEK

Location ID		5320-FP-N-L	5700-SB-S	5700-SB-S	5700-SB-S	5700-SB-S
Sample ID		5320-FP-N-L-3.5-4	5700-SB-S-2-2.5	5700-SB-S-2.5-3	5700-SB-S-3-3.5	5700-SB-S-3.5-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.5-4.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0
Date Sampled		12/19/16	12/19/16	12/19/16	12/19/16	12/19/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	51 U	38 U	38 U	50 U	53 U
Aroclor 1221	UG/KG	51 U	38 U	38 U	50 U	53 U
Aroclor 1232	UG/KG	51 U	38 U	38 U	50 U	53 U
Aroclor 1242	UG/KG	51 U	38 U	38 U	50 U	53 U
Aroclor 1248	UG/KG	51 U	38 U	38 U	50 U	53 U
Aroclor 1254	UG/KG	561 DJ	38 U	18.1 J	50 U	53 U
Aroclor 1260	UG/KG	2,400 D	32.3 J	54.3	717	260
Total Polychlorinated Biphenyls	UG/KG	2,961 J	32.3 J	72.4 J	717	260

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49233/MC49233R/MC49233T
SANDERS CREEK

Location ID		3600-FP-N	3600-FP-N	3600-FP-N	3600-FP-N	3600-FP-N
Sample ID		3600-FP-N-2-2.5	3600-FP-N-2.5-3	DUP-4	3600-FP-N-3-3.5	3600-FP-N-3.5-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.5-3.0	2.5-3.0	3.0-3.5	3.5-4.0
Date Sampled		12/20/16	12/20/16	12/20/16	12/20/16	12/20/16
Parameter	Units			Field Duplicate (1-1)		
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	44 U	42 U	45 U	47 U	43 U
Aroclor 1221	UG/KG	44 U	42 U	45 U	47 U	43 U
Aroclor 1232	UG/KG	44 U	42 U	45 U	47 U	43 U
Aroclor 1242	UG/KG	44 U	42 U	45 U	47 U	43 U
Aroclor 1248	UG/KG	44 U	42 U	45 U	47 U	43 U
Aroclor 1254	UG/KG	44 U	42 U	45 U	47 U	3,800 DJ
Aroclor 1260	UG/KG	2,660 D	1,250 DJ	5,070 DJ	21,800 D	10,800 D
Total Polychlorinated Biphenyls	UG/KG	2,660	1,250 J	5,070 J	21,800	14,600 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49233/MC49233R/MC49233T
SANDERS CREEK

Location ID		3650-SB-N	3650-SB-N	3650-SB-N	3650-SB-N	4725-SB-N
Sample ID		3650-SB-N-2-2.5	3650-SB-N-2.5-3	3650-SB-N-3-3.5	3650-SB-N-3.5-4	4725-SB-N-2-2.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5
Date Sampled		12/20/16	12/20/16	12/20/16	12/20/16	12/20/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	44 U	42 U	44 U	48 U	41 U
Aroclor 1221	UG/KG	44 U	42 U	44 U	48 U	41 U
Aroclor 1232	UG/KG	44 U	42 U	44 U	48 U	41 U
Aroclor 1242	UG/KG	44 U	42 U	44 U	48 U	41 U
Aroclor 1248	UG/KG	44 U	42 U	44 U	48 U	41 U
Aroclor 1254	UG/KG	8,200 DJ	2,820 DJ	2,960 DJ	48 U	1,640 DJ
Aroclor 1260	UG/KG	14,800 D	7,290 D	7,680 D	6,670 D	7,470 D
Total Polychlorinated Biphenyls	UG/KG	23,000 J	10,110 J	10,640 J	6,670	9,110 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49233/MC49233R/MC49233T
SANDERS CREEK

Location ID		4725-SB-N	4725-SB-N	4725-SB-N	4725-SB-N	4725-SB-S
Sample ID		4725-SB-N-2.5-3	DUP-3	4725-SB-N-3-3.5	4725-SB-N-3.5-4	4725-SB-S-2-2.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.5-3.0	2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5
Date Sampled		12/20/16	12/20/16	12/20/16	12/20/16	12/20/16
Parameter	Units		Field Duplicate (1-1)			
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	41 U	42 U	45 U	48 U
Aroclor 1221	UG/KG	40 U	41 U	42 U	45 U	48 U
Aroclor 1232	UG/KG	40 U	41 U	42 U	45 U	48 U
Aroclor 1242	UG/KG	40 U	41 U	42 U	45 U	48 U
Aroclor 1248	UG/KG	40 U	41 U	42 U	45 U	48 U
Aroclor 1254	UG/KG	948 DJ	1,050 DJ	1,340 DJ	45 U	3,630 DJ
Aroclor 1260	UG/KG	2,090 D	3,280 D	1,830 D	10,100 D	7,730 D
Total Polychlorinated Biphenyls	UG/KG	3,038 J	4,330 J	3,170 J	10,100	11,360 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49233/MC49233R/MC49233T
SANDERS CREEK

Location ID		4725-SB-S	4725-SB-S	4725-SB-S	4800-SB-N	4800-SB-N
Sample ID		4725-SB-S-2.5-3	4725-SB-S-3-3.5	4725-SB-S-3.5-4	4800-SB-N-2-2.5	4800-SB-N-2.5-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0
Date Sampled		12/20/16	12/20/16	12/20/16	12/20/16	12/20/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	38 U	38 U	38 U	45 U	45 U
Aroclor 1221	UG/KG	38 U	38 U	38 U	45 U	45 U
Aroclor 1232	UG/KG	38 U	38 U	38 U	45 U	45 U
Aroclor 1242	UG/KG	38 U	38 U	38 U	45 U	45 U
Aroclor 1248	UG/KG	38 U	38 U	38 U	45 U	45 U
Aroclor 1254	UG/KG	97.8 J	101 J	98.6 J	1,550 DJ	129 J
Aroclor 1260	UG/KG	265	357	459	3,960 D	286
Total Polychlorinated Biphenyls	UG/KG	363 J	458 J	557.6 J	5,510 J	415 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49233/MC49233R/MC49233T
SANDERS CREEK

Location ID		4800-SB-N	4800-SB-N	4810-FP-N	4810-FP-N-L	4810-FP-N-L
Sample ID		4800-SB-N-3-3.5	4800-SB-N-3.5-4	4810-FP-N-L-2-2.5	4810-FP-N-L-2.5-3	4810-FP-N-L-3-3.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0	3.0-3.5
Date Sampled		12/20/16	12/20/16	12/20/16	12/20/16	12/20/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	44 U	50 U	41 U	42 U	44 U
Aroclor 1221	UG/KG	44 U	50 U	41 U	42 U	44 U
Aroclor 1232	UG/KG	44 U	50 U	41 U	42 U	44 U
Aroclor 1242	UG/KG	44 U	50 U	41 U	42 U	44 U
Aroclor 1248	UG/KG	44 U	50 U	41 U	42 U	44 U
Aroclor 1254	UG/KG	43.2 J	24.8 J	41 U	42 U	828 DJ
Aroclor 1260	UG/KG	117	46.5 J	2,920 D	1,430 D	2,060 D
Total Polychlorinated Biphenyls	UG/KG	160.2 J	71.3 J	2,920	1,430	2,888 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49233/MC49233R/MC49233T
SANDERS CREEK

Location ID		4810-FP-N-L	4820-SB-N	4820-SB-N	4820-SB-N	4820-SB-N
Sample ID		4810-FP-N-L-3.5-4	4820-SB-N-2-2.5	4820-SB-N-2.5-3	4820-SB-N-3-3.5	4820-SB-N-3.5-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.5-4.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0
Date Sampled		12/20/16	12/20/16	12/20/16	12/20/16	12/20/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	41 U	41 U	43 U	40 U	42 U
Aroclor 1221	UG/KG	41 U	41 U	43 U	40 U	42 U
Aroclor 1232	UG/KG	41 U	41 U	43 U	40 U	42 U
Aroclor 1242	UG/KG	41 U	41 U	43 U	40 U	42 U
Aroclor 1248	UG/KG	41 U	41 U	43 U	40 U	42 U
Aroclor 1254	UG/KG	390 J	400 J	676 DJ	62.6 J	36.2 J
Aroclor 1260	UG/KG	827	1,230 D	1,560 D	232	155
Total Polychlorinated Biphenyls	UG/KG	1,217 J	1,630 J	2,236 J	294.6 J	191.2 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		2900-FP-S	2900-FP-S-L	2900-FP-S-L	2900-FP-S-L	2900-FP-S-L
Sample ID		2900-FP-S-L-2-2.5	2900-FP-S-L-2.5-3	2900-FP-S-L-3-3.5	DUP-5	2900-FP-S-L-3.5-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.5-3.0	3.0-3.5	3.0-3.5	3.5-4.0
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units				Field Duplicate (1-1)	
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	40 U	41 U	40 U	56 U
Aroclor 1221	UG/KG	40 U	40 U	41 U	40 U	56 U
Aroclor 1232	UG/KG	40 U	40 U	41 U	40 U	56 U
Aroclor 1242	UG/KG	40 U	40 U	41 U	40 U	56 U
Aroclor 1248	UG/KG	40 U	40 U	41 U	40 U	56 U
Aroclor 1254	UG/KG	40 U	40 U	41 U	40 U	68.2 J
Aroclor 1260	UG/KG	44.6	45.4	31.8 J	8.3 J	205
Total Polychlorinated Biphenyls	UG/KG	44.6	45.4	31.8 J	8.3 J	273.2 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		3000-FP-N	3000-FP-N	3000-FP-N	3000-FP-N	3825-SB-S
Sample ID		3000-FP-N-2-2.5	3000-FP-N-2.5-3	3000-FP-N-3-3.5	3000-FP-N-3.5-4	3825-SB-S-2-2.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	41 U	43 U	43 U	48 U	38 U
Aroclor 1221	UG/KG	41 U	43 U	43 U	48 U	38 U
Aroclor 1232	UG/KG	41 U	43 U	43 U	48 U	38 U
Aroclor 1242	UG/KG	41 U	43 U	43 U	48 U	38 U
Aroclor 1248	UG/KG	41 U	43 U	43 U	48 U	38 U
Aroclor 1254	UG/KG	536 J	43 U	98.8 J	252 J	38 U
Aroclor 1260	UG/KG	2,450 D	643	249	1,090 D	583
Total Polychlorinated Biphenyls	UG/KG	2,986 J	643	347.8 J	1,342 J	583

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		3825-SB-S	3825-SB-S	3825-SB-S	3950-SB-S	3950-SB-S
Sample ID		3825-SB-S-2.5-3	3825-SB-S-3-3.5	3825-SB-S-3.5-4	3950-SB-S-2-2.5	3950-SB-S-2.5-3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.5-3.0	3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	48 U	55 U	44 U	44 U
Aroclor 1221	UG/KG	40 U	48 U	55 U	44 U	44 U
Aroclor 1232	UG/KG	40 U	48 U	55 U	44 U	44 U
Aroclor 1242	UG/KG	40 U	48 U	55 U	44 U	44 U
Aroclor 1248	UG/KG	40 U	48 U	55 U	44 U	44 U
Aroclor 1254	UG/KG	40 U	48 U	55 U	44 U	44 U
Aroclor 1260	UG/KG	245	354	27.3 J	9,210 D	17,500 D
Total Polychlorinated Biphenyls	UG/KG	245	354	27.3 J	9,210	17,500

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		3950-SB-S	3950-SB-S	4100-FP-S	4100-FP-S-L	4100-FP-S-L
Sample ID		3950-SB-S-3-3.5	3950-SB-S-3.5-4	4100-FP-S-L-2-2.5	4100-FP-S-L-2.5-3	4100-FP-S-L-3-3.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.0-3.5	3.5-4.0	2.0-2.5	2.5-3.0	3.0-3.5
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	44 U	45 U	52 U	49 U	45 U
Aroclor 1221	UG/KG	44 U	45 U	52 U	49 U	45 U
Aroclor 1232	UG/KG	44 U	45 U	52 U	49 U	45 U
Aroclor 1242	UG/KG	44 U	45 U	52 U	49 U	45 U
Aroclor 1248	UG/KG	44 U	45 U	52 U	49 U	45 U
Aroclor 1254	UG/KG	44 U	45 U	52 U	49 U	45 U
Aroclor 1260	UG/KG	7,890 D	111	6,020 D	629	378
Total Polychlorinated Biphenyls	UG/KG	7,890	111	6,020	629	378

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		4100-FP-S-L	4800-SB-N	4800-SB-N	4800-SB-N	4800-SB-N
Sample ID		4100-FP-S-L-3.5-4	4800-SB-N-0-0.5	4800-SB-N-0.5-1	4800-SB-N-1.1.5	4800-SB-N-1.5-2
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.5-4.0	0.0-0.5	0.5-1.0	1.0-1.5	1.5-2.0
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	54 U	44 U	43 U	42 U	41 U
Aroclor 1221	UG/KG	54 U	44 U	43 U	42 U	41 U
Aroclor 1232	UG/KG	54 U	44 U	43 U	42 U	41 U
Aroclor 1242	UG/KG	54 U	44 U	43 U	42 U	41 U
Aroclor 1248	UG/KG	54 U	44 U	43 U	42 U	41 U
Aroclor 1254	UG/KG	54 U	648 J	1,760 DJ	1,590 DJ	41 U
Aroclor 1260	UG/KG	1,870 D	2,750 D	4,150 D	3,110 D	4,120 D
Total Polychlorinated Biphenyls	UG/KG	1,870	3,398 J	5,910 J	4,700 J	4,120

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		4810-FP-N	4810-FP-N	4810-FP-N	4810-FP-N	4810-SB-N
Sample ID		4810-FP-N-L-0-0.5	4810-FP-N-L-0.5-1	4810-FP-N-L-1-1.5	4810-FP-N-L-1.5-2	4810-SB-N-2-2.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-0.5	0.5-1.0	1.0-1.5	1.5-2.0	2.0-2.5
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	38 U	39 U	40 U	51 U
Aroclor 1221	UG/KG	40 U	38 U	39 U	40 U	51 U
Aroclor 1232	UG/KG	40 U	38 U	39 U	40 U	51 U
Aroclor 1242	UG/KG	40 U	38 U	39 U	40 U	51 U
Aroclor 1248	UG/KG	40 U	38 U	39 U	40 U	51 U
Aroclor 1254	UG/KG	53.0 J	56.1 J	39 U	40 U	8,920 DJ
Aroclor 1260	UG/KG	257	258	427	337	7,820 D
Total Polychlorinated Biphenyls	UG/KG	310 J	314.1 J	427	337	16,740 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		4810-SB-N	4810-SB-N	4810-SB-N	4820-SB-N	4820-SB-N
Sample ID		4810-SB-N-2.5-3	4810-SB-N-3-3.5	4810-SB-N-3.5-4	4820-SB-N-0-0.5	4820-SB-N-0.5-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.5-3.0	3.0-3.5	3.5-4.0	0.0-0.5	0.5-1.0
Date Sampled		12/21/16	12/21/16	12/21/16	12/21/16	12/21/16
Parameter	Units					
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	59 U	60 U	41 U	39 U	39 U
Aroclor 1221	UG/KG	59 U	60 U	41 U	39 U	39 U
Aroclor 1232	UG/KG	59 U	60 U	41 U	39 U	39 U
Aroclor 1242	UG/KG	59 U	60 U	41 U	39 U	39 U
Aroclor 1248	UG/KG	59 U	60 U	41 U	39 U	39 U
Aroclor 1254	UG/KG	5,120 DJ	9,160 DJ	1,930 DJ	86.7 J	39 U
Aroclor 1260	UG/KG	4,090 D	11,400 D	2,310 D	678	574
Total Polychlorinated Biphenyls	UG/KG	9,210 J	20,560 J	4,240 J	764.7 J	574

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC49234/MC49234R/MC49234T
SANDERS CREEK

Location ID		4820-SB-N	4820-SB-N
Sample ID		4820-SB-N-1-1.5	4820-SB-N-1.5-2
Matrix		Soil	Soil
Depth Interval (ft)		1.0-1.5	1.5-2.0
Date Sampled		12/21/16	12/21/16
Parameter	Units		
Polychlorinated Biphenyls			
Aroclor 1016	UG/KG	39 U	40 U
Aroclor 1221	UG/KG	39 U	40 U
Aroclor 1232	UG/KG	39 U	40 U
Aroclor 1242	UG/KG	39 U	40 U
Aroclor 1248	UG/KG	39 U	40 U
Aroclor 1254	UG/KG	18.3 J	38.6 J
Aroclor 1260	UG/KG	169	163
Total Polychlorinated Biphenyls	UG/KG	187.3 J	201.6 J

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL

TABLE 5
VALIDATED FIELD QC SAMPLE ANALYTICAL RESULTS
SANDERS CREEK

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		FIELD BLANK	EQUIP BLANK-2	EQUIP BLANK-3	EQUIP BLANK-4
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft)		-	-	-	-
Date Sampled		12/16/16	12/19/16	12/20/16	12/21/16
Parameter	Units	Equipment Blank (1-1)	Equipment Blank (1-1)	Equipment Blank (1-1)	Equipment Blank (1-1)
Polychlorinated Biphenyls					
Aroclor 1016	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Aroclor 1221	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Aroclor 1232	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Aroclor 1242	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Aroclor 1248	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Aroclor 1254	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Aroclor 1260	UG/L	0.25 U	0.25 U	0.25 U	0.25 U
Total Polychlorinated Biphenyls	UG/L	0.25 U	0.25 U	0.25 U	0.25 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 2/22/17
CHECKED BY: GEK 2/22/17

Detection Limits shown are PQL