FIELD SAMPLING PLAN ADDENDUM

UPPER HUDSON RIVER FLOODPLAIN
2016 FIELD SAMPLING PLAN ADDENDUM

Prepared for

General Electric Company

Albany, New York

Prepared by

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Clifton Park, New York 12065

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LIST OF ACRONYMS AND ABBREVIATIONS

2008 FSP	2008 *Upper Hudson River Floodplain Field Sampling Plan*
2016 FSP Addendum	*2016 Field Sampling Plan Addendum*
ALS	ALS Life Sciences
AOC	Administrative Settlement Agreement and Order on Consent for Remedial Investigation and Feasibility Study
bgs	below the ground surface
EPA	U.S. Environmental Protection Agency
FCR	*Floodplain Characterization Report: Upper Hudson River Floodplain*
FFU	flood frequency unit
Field Database	UHR Floodplain Field Database
FSP	Field Sampling Plan
GE	General Electric Company
GIS	Geographic Information System
GPS	Global Positioning System
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
Pace	Pace Analytical Services
PCB	polychlorinated biphenyl
QA/QC	Quality Assurance/Quality Control
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RI/FS Work Plan	*Remedial Investigation/Feasibility Study Work Plan*
UHR	Upper Hudson River

1 INTRODUCTION

This *2016 Field Sampling Plan Addendum* (2016 FSP Addendum), which is an Addendum to the *2008 Upper Hudson River Floodplain Field Sampling Plan* (2008 FSP; QEA and Arcadis 2008) has been prepared on behalf of the General Electric Company (GE) to describe the collection of additional data in 2016 to fill currently identified data gaps and other information needs and to further characterize polychlorinated biphenyl (PCB) concentrations in certain areas of the Upper Hudson River (UHR) floodplain. This additional data collection will be conducted pursuant to the Administrative Settlement Agreement and Order on Consent for Remedial Investigation and Feasibility Study (RI/FS AOC; EPA Index No. CERCLA 02-2013-2014) executed by GE and the U.S. Environmental Protection Agency (EPA) in September 2014. Sampling locations have been selected based on consideration of previous sampling results, following the methodology outlined in the *Remedial Investigation/Feasibility Study Work Plan* (RI/FS Work Plan; GE and EPA 2014), which is part of the RI/FS AOC. This 2016 FSP Addendum also describes the collection of additional information to characterize culvert connections and evaluate whether connections exist between the Hudson River and abandoned portions of the Champlain Canal within the UHR floodplain.[1] This 2016 FSP Addendum was originally submitted to EPA in June 2016, but has been revised in response to comments provided by EPA on that version.

The sampling and laboratory analyses described herein will be completed in accordance with the RI/FS Work Plan and the methods and procedures described in the 2008 FSP and the 2009, 2010, 2011, and 2012 Field Sampling Plan Addenda (Anchor QEA and Arcadis 2008, 2009, 2010, 2011, 2012), which were submitted under a prior AOC executed by GE and EPA in 2008 (EPA Index No. CERCLA-02-2008-2019).

1.1 Summary of Previous Investigations in the Upper Hudson River Floodplain

Between 1990 and 2015, numerous investigations were conducted within the UHR floodplain to characterize PCB concentrations in floodplain soil and flood sediment deposits.

[1] The data collection effort described in this 2016 FSP Addendum is not intended to complete the sampling and other data collection necessary for the Remedial Investigation (RI); additional sampling and other data collection will be undertaken as appropriate and necessary in subsequent years for that purpose, as described in the RI/FS Work Plan.

The investigations were conducted on various occasions by EPA, GE, the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the National Park Service (NPS), the National Oceanic and Atmospheric Administration (NOAA), and others and encompassed the area from Fort Edward to Troy, New York. Each of these data collection programs through 2014 is summarized in Section 3.5.1 and Table 3-4 of the *Floodplain Characterization Report: Upper Hudson River Floodplain* (FCR; Anchor QEA et al. 2015).[2] In addition to the programs described in the FCR, GE conducted floodplain soil sampling in 2015 to characterize PCB concentrations in a proposed support area to be used for dredging in Certification Unit 60-2 of the UHR (Arcadis 2015a). Further, EPA conducted flood deposit sampling in 2015 to characterize PCB concentrations in materials deposited as a result of a flooding event that occurred in April 2015.

Through these programs, a total of 4,400 soil cores have been collected within the floodplain Study Area defined in the AOC and the RI/FS Work Plan. The numbers of UHR floodplain soil, flood deposit, and standing water area sediment cores and samples collected between 2000 and 2015 are summarized in Tables 1-1, 1-2, and 1-3, respectively. These data are summarized by the UHR reaches, which are defined by the pools in the UHR, separated by locks and dams. Reach 1 begins at the Federal Dam in Troy and Reach 8 is the northernmost reach, referred to as the Thompson Island Pool. These reaches and the locks and dams separating them are shown in Figure 1-1.[3] The data collected prior to 2000 – which consist of a total of 1,227 cores collected from a Rogers Island investigation in the 1990s, an NPS investigation in 1996-1998, and a 1999 investigation of the Old Schuylerville Canal (see Section 3.5.1 of the FCR) – are not included in Tables 1-1 through 1-3; the data from these investigations will be evaluated as needed through the course of the RI/FS but have not been

[2] The results of the floodplain soil sampling conducted by GE in accordance with a 2005 Work Plan (BBL 2005), the 2008 FSP, and the above-referenced prior FSP addenda were provided to EPA in a series of Data Summary Reports (BBL 2006; Arcadis and Anchor QEA 2009, 2010, 2011, 2012, 2013, 2014; see also Arcadis 2014). As also described in the FCR, based on floodplain soil PCB concentrations determined by sampling, certain properties were identified in 2007, 2009, 2010, 2011, 2012, and 2014 for implementation of Short-Term Response Actions consisting of the installation and maintenance of soil/stone covers and/or warning signs.

[3] Since Reach 5 is quite long, it has been divided for convenience into three sub-reaches (Reaches 5A, 5B, and 5C), as shown in Figure 1-1.

included in the PCB dataset used to evaluate data sufficiency due to insufficient location and/or quality control information and uncertainty regarding whether samples are representative of current conditions. During the remainder of the sampling programs from 2000 through 2015, a total of 7,504 soil samples (including quality assurance/quality control [QA/QC] samples) were collected from 3,173 locations in the UHR floodplain. Additionally, 282 flood sediment deposit samples (including QA/QC samples) were collected in the UHR floodplain since 2008, and 138 standing water area sediment samples (including QA/QC samples) were collected from 50 locations in the UHR floodplain since 2003.

Table 1-1
Summary of Soil Samples Collected in the Upper Hudson River Floodplain by River Reach

Reach	Cores	Samples	Duplicates	Total Samples
8	742	1,637	100	1,737
7	244	531	31	562
6	329	747	43	790
5A	454	980	57	1,037
5B	414	964	56	1,020
5C	325	752	49	801
4	81	177	6	183
3	134	302	12	314
2	193	431	27	458
1	218	502	42	544
N/A	39	55	3	58
Total	**3,173**	**7,078**	**426**	**7,504**

Notes:
N/A – Coordinates unavailable. Cores were not assigned to a river reach.

Table 1-2
Summary of Flood Sediment Deposit Samples Collected in the Upper Hudson River Floodplain by River Reach

Reach	Flood Deposit Samples	Flood Deposit Duplicates	Total Flood Deposit Samples
8	81	6	87
7	19	2	21
6	16	1	17
5A	40	5	45
5B	36	3	39
5C	23	2	25
4	3	0	3
3	25	3	28
2	7	1	8
1	9	0	9
Total	**259**	**23**	**282**

Table 1-3
Summary of Standing Water Area Sediment Samples Collected in the Upper Hudson River Floodplain by River Reach

Reach	Standing Water Area Cores	Standing Water Area Samples	Standing Water Area Duplicates	Total Standing Water Area Samples
8	20	54	2	56
7	1	3	0	3
6	9	21	2	23
5A	8	20	1	21
5B	2	6	1	7
5C	8	21	1	22
4	0	0	0	0
3	0	0	0	0
2	1	2	0	2
1	1	3	1	4
Total	**50**	**130**	**8**	**138**

1.2 Field Sampling Program Objectives

The overall objective of the 2016 investigation is to provide additional data to refine the understanding of the nature and extent of PCB contamination within the UHR floodplain, as well as to collect certain additional information for the RI. Additionally, the data will be used, where appropriate, to assist in the evaluation of the need for and type of Short-Term Response Actions at select properties.

2 SAMPLING DATA AND INFORMATION GAP DESIGN

This section describes the rationale for selecting sampling locations and identifies the proposed number of samples to be collected in 2016. The additional information to be collected as part of 2016 field investigations (e.g., culvert invert elevation data, hydraulic connections) are also described in this section.

2.1 Sample Location Selection

The numbers of soil sampling locations were identified using the data gap evaluation approach outlined in the RI/FS Work Plan, and further described in the FCR, as well as in discussions with EPA. The approach used includes applying data sufficiency criteria to flood frequency units (FFUs); these are units of the floodplain that have been partitioned by flood frequency and flow type. Flood frequency boundaries are defined by flood return periods (i.e., 2-, 5-, 10-, 20-, 50-, and 100-year) and flow type boundaries are defined by the manner in which flooding occurs, either by direct flow in areas that exhibit a general increase in elevation moving inland from the river bank (direct-flow areas) or by lateral flow through a low-lying feature in portions of the floodplain that are separated from the river by higher-relief land or where the flood flow exceeds the higher-elevation land near the river (backwater areas). Additionally, some areas of the floodplain that do not exhibit the typical pattern of decreasing PCB levels with decreasing inundation frequency have been designated as "unique areas." The floodplain has also been divided longitudinally into local regions. The targeted number of soil sampling locations, identified through evaluation of the existing floodplain soil samples included in Table 1-1, are summarized by direct-flow, backwater, and unique areas and by river reach in Table 2-1 below, and by local region in Table 2-2 (attached). It should be noted that, since the Study Area for the floodplain RI/FS extends slightly farther upstream than the upstream boundary of Reach 8 to include the area between the former Fort Edward dam and the pool at the base of Bakers Falls (known as the former Fort Edward Pool), these tables include that area.

Table 2-1
Targeted Number of Sample Locations by River Reach

Reach	Targeted Sample Locations			Total Targeted Locations 2016
	Direct-Flow Areas	Backwater Areas	Unique Areas	
Former Fort Edward Pool	56	NA	NA	56
R8	53	49	6	108
R7	34	21	0	55
R6	68	43	11	122
R5A	61	33	6	100
R5B	56	63	0	119
R5C	31	31	3	65
R4	0	0	7	7
R3	40	14	7	61
R2	56	33	3	92
R1	137	5	0	142
Total	**592**	**292**	**43**	**927**

The RI/FS Work Plan data gap evaluation approach identifies the general sampling locations by identifying data gaps within FFUs. Specific sampling locations were selected within FFUs by prioritizing areas with the largest data gaps in land cover, land use, and spatial coverage. The proposed sample locations are presented in Figures 2-1 through 2-15, along with sampling locations from previous sampling events. To help ensure that the samples are collected on the targeted properties, the proposed sampling locations have been placed a minimum of 10 to 15 feet from property boundaries as determined by aerial photographs overlain on property tax parcel boundaries obtained from municipal authorities. In addition, as discussed further in Section 3.2, field personnel performing sample location survey and stake-out will be equipped with global positioning system (GPS) equipment capable of displaying property boundary information. The sampling locations shown in Figures 2-1 through 2-15 are subject to obtaining access to the properties involved, as discussed in Section 3.1.1.

2.2 Proposed Sample Locations and Depths

Approximately 927 locations and 1263 samples are proposed for the 2016 sampling activities, as summarized in Table 2-3 below. At the majority of sampling locations, samples will be collected from the depth interval of 0 to 12 inches below the ground surface (bgs). At a subset of the sampling locations (168 locations), samples will be collected from the 0- to 6-inch and 6- to 12-inch bgs depth intervals. Based on discussions with EPA, the specific locations selected for the collection of samples from the 0- to 6-inch and 6- to 12-inch depth intervals in Reaches 1 through 8 are situated within the 20-year floodplain, generally in areas where prior samples showed substantial variability in Total PCB concentrations between these intervals and within identified human use areas, and were also selected to provide overall spatial coverage across the 20-year floodplain. Additionally, all sample locations within NPS properties will be sampled at the 0- to 6-inch and 6- to 12-inch depth intervals. Within the former Fort Edward Pool, such samples will be collected at 50% of the sample locations due to the lack of existing data in that area.

In addition, at all locations that are targeted for the 0- to 6-inch and 6- to 12-inch bgs depth interval collection (including 50% of the locations within the former Fort Edward Pool), samples will also be collected from the 12- to 24-inch bgs depth interval and will be held at the laboratory pending review of the data from the overlying depth increments. A subset of those deeper samples (up to approximately two-thirds of those samples) will be analyzed for PCBs based on the results of the analysis of the overlying depth interval.

The numbers of locations where samples will be collected from the 0- to 6-inch, 6- to 12-inch, and 12- to 24-inch depth intervals are also summarized in Table 2-3.

Table 2-3

Targeted Number of Sample Locations and Samples by River Reach

River Reach	Total Targeted Sample Locations	Targeted Samples			Total Targeted Samples
		0- to 12-inch or 0- to 6-inch bgs[1]	6- to 12-inch bgs[1]	12- to 24-inch bgs[2]	
Former Fort Edward Pool	56	56	28	28	112
8	108	108	13	13	134
7	55	55	8	8	71
6	122	122	19	19	160
5A	100	100	27	27	154
5B	119	119	25	25	169
5C	65	65	6	6	77
4	7	7	3	3	13
3	61	61	9	9	79
2	92	92	12	12	116
1	142	142	18	18	178
Total	**927**	**927**	**168**	**168**	**1263**

Notes:

1. All sampling locations will have a first sampling interval of either 0- to 12-inch bgs (759 locations) or 0- to 6-inch bgs (168 locations). All sampling locations with a 0- to 6-inch bgs first sampling interval will also have a 6- to 12-inch bgs sampling interval.
2. At all locations where samples will be collected from 0- to 6-inch and 6- to 12-inch bgs depth intervals, samples will also be collected from the 12- to 24-inch bgs depth interval and will be held at the laboratory for potential future analysis.

bgs – below ground surface

2.3 Data Collection for Other Information Gaps

This section describes the other information collection activities that GE proposes to conduct during the 2016 field investigations.[4]

Culvert connections between the UHR and certain backwater areas of the floodplain have been identified by EPA through a Potential Backwater Area Evaluation (EPA 2009a, 2009b) and subsequent desktop evaluations by GE using aerial and video photography. A list of the culvert connections identified to date is presented in Table 2-4 (attached) and their locations are shown in Figures 2-1 through 2-15. Invert elevations are currently available for a subset of these culverts as indicated in Table 2-4, but are needed for the remainder to determine the Hudson River flow level that must be achieved in order for the river water to reach the culvert and potentially inundate floodplain areas that have no other connection to the river. These culvert invert elevations will be collected during the 2016 field effort.

Certain sections of the abandoned Champlain Canal will also be evaluated as part of the 2016 field effort to determine whether a culvert or other connection (e.g., drainage swale) to the Hudson River exists that could allow these areas to become inundated during higher flows or flooding events. The abandoned Champlain Canal areas identified for field evaluation are presented in Table 2-5 and are shown in Figures 2-1 through 2-15.

[4] In addition to the information collection activities described in this section, GE will complete in 2016 the field verification of standing water areas in the floodplain and the field verification of potential human use areas in near-shore sediment areas, which were begun in the fall of 2015 in accordance with a letter proposal (Arcadis 2015b) dated October 6, 2015, and approved by EPA on October 8, 2015. Most of these field verification activities were completed in 2015, but the remaining ones have been or will be completed in 2016 following the same approaches approved and used in 2015. Following completion of the field verification of standing water areas, GE will evaluate the need for additional sampling of the sediments in standing water areas, and will propose such sampling, where appropriate, in accordance with the process described in the RI/FS Work Plan.

Table 2-5

Potential Connections between the Old Champlain Canal and the Upper Hudson River

Local Region	River Mile	Bank	Description
R8-03	192	East	Canal area that runs through pond on FPP-PRO-1718
R7-01	188-187	East	Canal area that is adjacent to Reach 7 land cut
R6-02/R6-03	184	East	Canal area adjacent to Route 4
R5-02/R5-03	179	West	Canal area just north of Coveville
R5-06	176	West	Canal area adjacent to Route 4

Notes:
UHR – Upper Hudson River

3 PROCEDURES FOR SAMPLE AND OTHER INFORMATION COLLECTION

This section describes the protocols that will be followed for obtaining property access, field survey and sample stake-out, sample location inspection, soil sample collection, sample processing, laboratory analyses, and collection of other information during the 2016 field activities. QA/QC activities and procedures are presented in the 2008 FSP.

The field sampling activities will be initiated within approximately 2 weeks following the receipt of access permission from a sufficient number of property owners to warrant the commencement of sampling, to be determined in consultation with EPA. EPA will be notified at least 7 days prior to the commencement of sampling and will be kept advised of the progress of the field activities, as discussed further in Section 4.1.

3.1 Obtaining Property Access

3.1.1 Access for Sampling

Access permission must be received prior to conducting any field activities on the properties targeted for sampling. GE will initiate efforts to obtain property access after EPA approves the sampling locations proposed in this 2016 FSP Addendum. GE will use its best efforts to obtain property access and sampling permission from property owners of all tax parcels containing proposed sample locations. GE will attempt to obtain such permission not only for its authorized representatives, but also for EPA, NYSDEC, NYSDOH, and their contractors and oversight representatives.

If property owners have already provided GE permission to access their properties during earlier sampling efforts, GE will attempt to contact them via telephone to obtain their verbal approval for additional sampling. If necessary, GE will make follow-up phone calls at varying times of the day in an effort to reach individuals. As has been done in the past, GE will not require these property owners to sign updated access agreement forms; verbal authorization will be acceptable to permit sampling on their properties. Verbal authorization received by telephone will be documented by GE's representative for access issues (Behan Communications) in its property owner database. If GE is unable to reach property owners by telephone, GE will send a letter requesting that the property owner contact GE to discuss additional sampling. If access is not obtained after multiple telephone

calls and/or sending a letter, GE will inform EPA that access to the property has not been obtained, and GE and EPA will determine whether additional outreach is appropriate. If verbal authorization is received on site, it will be documented by the field team in the field notebooks and then communicated to Behan Communications via e-mail for documentation in its property owner database.

GE has provided EPA with a list of targeted properties where the property owners have previously denied GE access to their properties during earlier sampling efforts. EPA has agreed to take the lead in attempting to obtain access permission for these properties. EPA will also take the lead in obtaining access to properties owned by the NPS, and GE will cooperate with EPA in that effort.

For properties where access has not previously been requested, GE will mail a letter and access agreement form to the property owners. Approximately 10 days following this mailing, GE will attempt to contact (via telephone) property owners that have not responded to the mailing to obtain the signed access forms. If access permission is not obtained after 2 or 3 telephone calls at varying times of day, GE will notify EPA that access to the property has not been obtained, and GE and EPA will determine whether additional outreach is appropriate.

If access cannot be obtained to a property proposed to be sampled, GE and EPA will discuss whether the property will be removed from further consideration for sampling and/or whether an alternate sampling location will be identified. If an alternate location is desired, GE and EPA will attempt to locate the alternate sampling location on property where access permission has already been, or is likely to be, provided. In the event that sampling at an alternate location is not practicable, GE and EPA may decide to remove the property from further consideration from sampling.

For properties owned by the New York State Canal Corporation (NYSCC), GE will provide NYSCC with a list of NYSCC-owned properties targeted for sampling. GE will request that NYSCC provide a list of its permittees for each targeted property. Following issuance of a work permit to GE's consultant, GE will contact the permittees by telephone to notify them of NYSCC-granted access.

Copies of all signed access agreements will be provided to EPA at the conclusion of outreach efforts. GE will also provide regular updates to EPA on its outreach efforts and progress.

3.1.2 Access for Other Information Collection

For field activities on the properties targeted for other information-gathering activities, GE will initiate efforts to obtain access after EPA approves this 2016 FSP Addendum. GE will attempt to obtain property access not only for its authorized representatives, but also for EPA, NYSDEC, NYSDOH, and their contractors and oversight representatives.

GE will contact the property owners via telephone or letter (if telephone contact information is unavailable) to obtain permission to access the property. As has been done in the past when access to a property was desired but no sample collection was planned, GE will not ask property owners to sign an access agreement for this engineering information collection. Rather, verbal authorization will be sufficient for GE to access a property to collect this information. Such verbal authorization will be documented in Behan Communications' property owner database in the same way as discussed in Section 3.1.1. If necessary, GE will make follow-up telephone calls at varying times of the day in an effort to reach individuals. If access is not obtained after two or three telephone calls are made and/or a letter is mailed, GE will inform EPA that access to the property has not been obtained, and GE and EPA will determine whether additional outreach is appropriate.

3.2 Survey, Stake-Out, and Sample Location Inspection Activities

All field activities related to sampling (surveying, stake-out, sample location inspection, and sampling) will be completed in a single site visit to the extent practicable. Upon mobilization to each property targeted for sampling, representatives of GE will survey and stake out the proposed sampling locations. The surveying will be performed using either survey-grade GPS equipment or conventional survey equipment. The appropriate Geographic Information System (GIS) data layers (e.g., aerial photographs, property parcel boundaries, and previous sampling locations) will be uploaded to the GPS unit. In the event that GPS cannot be used, conventional survey techniques may be used in conjunction with aerial photography and other available data to locate property boundaries, consistent with previous sampling events.

Soil sample stake-out will utilize the following procedure: First, the target coordinates will be marked and the resulting elevation will be checked against the desired elevation range. If the proposed location is not suitable for sampling (e.g., due to utility location, presence of a tree root or other at-grade structure/obstruction, or a specific safety concern), the sample will be moved to a suitable location on the property within the flood frequency interval being targeted, and the elevation will be recorded. Once the sampling locations have been staked out, GE and EPA representatives will review the proposed sample locations in the field and reach concurrence on the marked locations.

All documentation of any moved, added, or eliminated sample locations will also be uploaded to the UHR Floodplain Field Database (Field Database) to ensure that location changes will be accurately tracked. The final sample location coordinates, as agreed upon by GE and EPA, will be uploaded to the Field Database on a daily basis. Prior to leaving each sampling site, representatives of GE and EPA will compare field notes and resolve any apparent discrepancies.

3.3 Soil Sample Collection

This section presents the sample collection and handling procedures to be implemented for the floodplain sampling activities.

3.3.1 Soil Sample Collection Methods and Equipment

The 2016 floodplain soil samples will be collected from the locations depicted in Figures 2-1 through 2-15 using a Macro-Core™ sampling device manually advanced with a slide hammer. The Macro-core™ device consists of an outer steel barrel with an inner acetate liner (1.5-inch inside diameter). Attempts will be made to advance the Macro-core™ sampling device to the targeted sampling depth. If refusal is encountered before reaching the targeted sampling depth, two additional attempts will be made within approximately 3 feet of the original sample location (ensuring that the new location remains within the desired elevation range). If refusal is still encountered or if the measured recovery is less than 75% of the targeted sample depth, one additional attempt to collect a soil core will be made using a 3-inch diameter, 6-inch long stainless steel hand auger. For samples collected with the

hand auger, the recovered soil will be placed into sealable plastic bags, sealed, and marked with the sample location and depth interval.

After a total of four attempts have been made to achieve the targeted sample depth or obtain sufficient soil recovery, the core with the greatest recovery will be retained for processing and analysis. The core will be labeled with the appropriate sample nomenclature, and transported to the designated processing area for characterization, segmentation, and sample collection as described in Section 3.3.2.

Documentation of the nature and condition of the ground surface at each soil sampling location will be recorded in the field logbook and in the Field Database. Logbook entries may include statements such as: disturbed soils, evidence of erosion or deposition, evidence of cultivation, riparian vegetation, and/or grassland. In addition, photographs documenting the sample locations relative to other site features will be taken. This information will then be entered into the Field Database.

3.3.2 Sample Core Processing and Laboratory Analyses

At the sample processing area, the cores will be opened and visually characterized. Observations relative to the soil type (e.g., gravel, coarse sand, fine sand) and grain size characteristics (e.g., size, sorting, and texture) will be noted. Other observations, including sedimentary structures, organic matter, and moisture, will also be documented, as appropriate. The cores will be described using the Unified Soil Classification System and the following designations with respect to the types of grain size present: primary constituent (underlined or capitalized); secondary constituent(s) designated by "and" (if approximately 50% of the sample – should only be utilized if a second primary constituent is identified), "some" (if approximately 30% to 50% of the sample), "little" (if approximately 10% to 30% of the sample), and/or "trace" (if less than 10% of the sample).[5] The soil type observations for each sample depth increment, as well as the sample penetration depth and sample recovery,

[5] These soil type designations are consistent with the *Standard Operating Procedure – Soil Boring Installation and Soil Sampling*, which was Appendix A to the *Upper Hudson River Floodplains 2009 Field Sampling Plan Addendum* (Anchor QEA and Arcadis 2009). A copy of that Standard Operating Procedure will be maintained in the sample processing area and will be reviewed by personnel performing sample collection activities.

will be entered into the Field Database for upload into the UHR Floodplain Data Management System.

Once the cores are visually characterized and observations are logged into the Field Database, they will be segmented into the appropriate depth intervals for each sample location. As discussed in Section 2.2, the 0- to 12-inch depth interval will be targeted at the majority of sample locations (759 locations), and the cores at the other locations (168 locations) will be segmented into 0- to 6-inch, 6- to 12-inch, and 12- to 24-inch depth intervals. The 12- to 24-inch depth interval samples will archived at the laboratory pending receipt and review of the PCB analytical results for the 0- to 12-inch or 0- to 6-inch and 6- to 12-inch depth intervals for each core.

The entire sample depth interval designated for analysis will be placed in an aluminum sampling pan and mixed thoroughly to obtain a homogeneous sample. Debris and rocks greater than 0.5 inch in size will be removed from the soil and the samples will be containerized in clean laboratory-supplied glassware. The sample containers will be identified using the alpha-numeric designation system described in the 2008 FSP and shipped under chain-of-custody to ALS Life Sciences (ALS) or Pace Analytical Services (Pace) for analysis for PCBs and total organic carbon in accordance with EPA SW846 Method 8082 and the Lloyd Kahn Method, respectively. The soil samples will be packaged with sufficient ice to maintain the sample temperature at approximately 4 degrees centigrade during shipment to the laboratory.

Field personnel will follow the decontamination procedures outlined in the 2008 FSP. Non-disposable equipment will be cleaned with Alconox® detergent, rinsed with deionized water, and dried with disposable towels (as applicable) between use for each sample location. Disposable nitrile gloves will be worn by sampling personnel and will be changed between activities at each discrete sample collection location. Dedicated acetate liners will also be changed between sampling locations to prevent cross contamination of samples.

Field personnel will collect and document the appropriate amount of QC samples (blind duplicates, matrix spikes and matrix spike duplicates at a rate of 1 per 20 samples, and field [rinse] blanks at a rate of 1 per day or 1 per 20 samples), as described in the 2008 FSP. Data

received from the laboratory will undergo data reduction, verification, and validation in accordance with the 2008 FSP. Remaining QA/QC elements and procedures, not specifically discussed herein, will be followed as specified in Section 4 of the 2008 FSP. Copies of current laboratory NYSDOH Environmental Laboratory Approval Program accreditations and relevant Standard Operating Procedures for ALS and Pace are included as Appendix A.

3.3.3 Containerization, Staging, and Management of Investigation-Derived Wastes

Excess soil, disposable sampling equipment, used personal protective equipment, and decontamination water and debris generated during the field work and sample processing activities will be containerized in 55-gallon drums at the Sediment Processing Facility. The drums will be labeled appropriately based on their contents and will be staged temporarily for subsequent waste profiling, transportation, and off-site disposal. Waste disposal documentation will be included in the 2016 Data Summary Report, as described in Section 4.4.

3.4 Information Gap Data Collection Activities

As stated in Section 2.3, culvert invert elevations are needed to determine the Hudson River flow level that must be achieved for river water to reach the culverts and potentially inundate floodplain areas that have no other connection to the river. Similarly, certain sections of the abandoned Champlain Canal will be evaluated as part of the 2016 field effort to determine whether a culvert or other connection (e.g., drainage swale) to the Hudson River exists that could allow these areas to become inundated during higher river flows or flooding events.

Prior to the initiation of field activities related to filling these information gaps, existing site information will be reviewed and a field reconnaissance will be conducted from public roadways in an effort to verify the existence of the culverts and potential abandoned Champlain Canal connections identified in Tables 2-4 and 2-5, respectively, and to determine whether the location is situated within a property boundary and thus requires access permission.

Upon mobilization to each targeted location, GE representatives will document its location and other pertinent data. All documentation of culvert and potential abandoned Champlain Canal connections, including the horizontal location and elevations of the upstream and downstream ends of culvert inverts or drainage swales, as well as the culvert diameter and materials of construction, will be logged in the field notes. In addition, photographs documenting the connections relative to other site features will be taken. Prior to leaving each property, representatives of GE and EPA will compare field notes and resolve any apparent discrepancies.

Surveying will be performed using either survey-grade GPS equipment or conventional survey equipment. The appropriate GIS data layers (e.g., aerial photographs, property parcel boundaries, and potential connection locations) will be uploaded to the GPS unit. In the event that GPS cannot be used, conventional survey techniques may be used in conjunction with aerial photography and other available data to locate property boundaries, consistent with previous sampling events.

4 PROJECT COMMUNICATIONS AND REPORTING

This section describes the project communication and reporting activities that will be undertaken by GE to facilitate the exchange of information related to the 2016 field sampling activities.

4.1 Project Teleconference Calls and Meetings

Following initiation of the property access activities described in Section 3.1, GE will provide status updates during project teleconference calls and/or meetings with EPA. The purpose of these teleconference calls/meetings will be to discuss the progress to date, upcoming scheduled activities, and any issues related to property access, and to facilitate the timely exchange of information between GE and EPA. These teleconference calls/meetings will be held throughout the duration of the property access outreach and field sampling activities.

4.2 Monthly Progress Reports

As required by the AOC, GE will describe the activities completed in the Monthly Progress Reports. The Monthly Progress Reports will include the following:

- A summary of the activities completed during the reporting period;
- Results of sampling, tests, and data received during the reporting period;
- A summary of planned/scheduled activities for the next 2 months;
- Other information related to the progress of the work; and
- A description of any delays encountered or anticipated, and efforts to mitigate those delays.

4.3 Data Management and 2016 Data Summary Report

The sampling data and other information collected in 2016 as part of the field investigations described in this 2016 FSP Addendum will be managed and provided to EPA consistent with the memorandum that GE submitted to EPA on August 2, 2016, describing the approach and naming convention for tracking parcels during floodplains sampling activities. The data will also be summarized in a 2016 Data Summary Report, to be submitted to EPA within 60 days after receipt of the final validated data from these field investigations.

In addition, based on the additional data collected as part of the 2016 field investigations as well as prior data from the floodplain, GE will complete an evaluation of data sufficiency. If additional investigations are deemed necessary or appropriate, those additional investigations will be proposed and described in accordance with the process set forth in the RI/FS Work Plan – i.e., through submission of the RI Field Sampling Plan/Quality Assurance Project Plan and other deliverables described in the RI/FS Work Plan.

5 SCHEDULE

The schedule for the activities discussed in this 2016 FSP Addendum is presented in Table 5-1 below.

Table 5-1
Schedule for 2016 Investigations

Activity	Timeframe/Comments
Conduct property access outreach	Already initiated; to be continued following EPA approval of 2016 FSP Addendum.
Initiate field survey, sample location inspection, and sample collection	Within 7 days of EPA approval of 2016 FSP Addendum, assuming receipt of access permission from a sufficient number of property owners.
Complete laboratory data validation	Within 45 days following receipt of the last hard-copy data package from the laboratory.
Submit 2016 Data Summary Report	Within 60 days of receipt of the final validated data from 2016 field investigations.

6 REFERENCES

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TABLES

Table 2-2
Targeted Number of Sample Locations by Local Region

Local Region	Targeted Sample Locations			Total Targeted Locations 2016
	Direct Flow	Backwater Flow	Unique Areas	
Former Fort Edward Pool	56	0	0	56
R8-01	14	1	2	17
R8-02	8	10	1	19
R8-03	8	19	0	27
R8-04	10	9	3	22
R8-05	6	3	0	9
R8-6I	0	0	0	0
R8-7I	0	0	0	0
R8-8I	7	7	0	14
R7-01	13	9	0	22
R7-03	12	12	0	24
R7-4I	9	0	0	9
R7-5I	0	0	0	0
R6-01	5	4	4	13
R6-02	6	8	0	14
R6-03	22	4	0	26
R6-04	28	23	0	51
R6-05	7	4	0	11
R6-6I	0	0	2	2
R6-7I	0	0	5	5
R5-01	10	6	0	16
R5-01A	12	0	0	12
R5-02	13	17	6	36
R5-03	15	10	0	25
R5-4I	0	0	0	0
R5-05	9	12	0	21
R5-05A	20	14	0	34
R5-06	10	15	0	25
R5-07	8	14	0	22
R5-08	1	16	3	20
R5-09	9	8	0	17
R5-10	17	0	0	17
R5-11	13	15	0	28
R5-13I	11	0	0	11
R4-01	0	0	6	6
R4-02	0	0	0	0
R4-3I	0	0	1	1
R3-01	23	9	0	32
R3-02	17	5	3	25
R3-3I	0	0	1	1
R3-4I	0	0	3	3

Table 2-2
Targeted Number of Sample Locations by Local Region

Local Region	Targeted Sample Locations			Total Targeted Locations 2016
	Direct Flow	Backwater Flow	Unique Areas	
R2-01	21	19	0	40
R2-02	11	14	3	28
R2-03	24	0	0	24
R1-01	21	1	0	22
R1-02	8	0	0	8
R1-03	20	4	0	24
R1-03A	8	0	0	8
R1-4I	11	0	0	11
R1-05	42	0	0	42
R1-06	27	0	0	27
Total	**592**	**292**	**43**	**927**

Table 2-4
Potential Culvert Connections to the Upper Hudson River Floodplain

Unique ID	Reach	Local Region	Bank	River Mile
C-01	8	R8-01	East	195-194
C-02	8	R8-04	West	193-192
C-03	8	R8-04	West	192-191
C-04[1]	8	R8-03	East	192-191
C-05	8	R8-04	West	192-191
C-06	8	R8-04	West	191-190
C-07[2]	8	R8-05	West	191-190
C-08	8	R8-05	West	191-190
C-09[2]	8	R8-05	West	191-190
C-10[2]	8	R8-05	West	190-189
C-11[2]	8	R8-05	West	190-189
C-12[2]	8	R8-05	West	190-189
C-13[2]	8	R8-05	West	190-189
C-14[2]	8	R8-05	West	190-189
C-15	8	R8-02	East	190-189
C-16	8	R8-05	West	189-188
C-17	8	R8-05	West	189-188
C-18	7	R7-03	West	188-187
C-19	7	R7-03	West	188-187
C-20	7	R7-01	East	187-186
C-21	6	R6-01	East	186-185
C-22	6	R6-02	East	185-184
C-23	6	R6-02	East	185-184
C-24	6	R6-02	East	185-184
C-25	6	R6-03	East	184-183
C-26	6	R6-03	East	184-183
C-27	6	R6-05	West	184-183
C-28	5A	R5-01	East	184-183
C-29	5A	R5-02	West	182-181
C-30	5B	R5-06	West	176-175
C-31	5B	R5-06	West	176-175
C-32	5B	R5-05	East	176-175
C-33	5B	R5-09	West	175-174
C-34	5B	R5-07	West	175-174
C-35	5B	R5-09	West	174-173
C-36	5B	R5-09	West	174-173
C-37	5B	R5-09	West	174-173
C-38	5C	R5-05A	East	173-172
C-39	5C	R5-08	East	173-172
C-40	5C	R5-09	West	173-172
C-41	5C	R5-10	West	172-171
C-42	5C	R5-11	West	171-170

Table 2-4
Potential Culvert Connections to the Upper Hudson River Floodplain

Unique ID	Reach	Local Region	Bank	River Mile
C-43	5C	R5-11	West	171-170
C-44	5C	R5-11	West	171-170
C-45	5C	R5-11	West	170-169
C-46	5C	R5-08	East	170-169
C-47	5C	R5-08	East	169-168
C-48	4	R4-02	West	169-168
C-49	4	R4-02	West	167-166
C-50	3	R3-02	West	166-165
C-51	3	R3-02	West	164-163
C-52	2	R2-01	East	163-162
C-53	2	R2-02	West	163-162
C-54	2	R2-01	East	163-162
C-55	2	R2-01	East	162-161
C-56	2	R2-02	West	162-161
C-57	2	R2-01	East	162-161
C-58	2	R2-01	East	161-160
C-59	2	R2-01	East	161-160
C-60	2	R2-03	West	161-160
C-61	2	R2-01	East	161-160
C-62	2	R2-03	West	161-160
C-63	2	R2-01	East	161-160
C-64	2	R2-03	West	160-159
C-65	1	R1-03	West	160-159
C-66	1	R1-01	East	159-158
C-67	1	R1-02	East	158-157
C-68	1	R1-02	East	158-157
C-69	1	R1-02	East	158-157
C-70	1	R1-01	East	158-157

Notes:

1. Culvert has been field verified.

2. Surveyed elevations for inverts: C-07 = 123.35, C-09 = 117.50, C-10 = 121.58, C-11 = 124.97, C-12 = 117.98, C-13 = 123.63, and C-14 = 123.46.

FIGURES

(Provided at ftp://ftp.anchorqea.com)

APPENDIX A
ALS AND PACE LABORATORY ACCREDITATIONS AND STANDARD OPERATING PROCEDURES

(Provided at ftp://ftp.anchorqea.com)