FIELD SAMPLING PLAN

UPPER HUDSON RIVER FLOODPLAINS 2010 FIELD SAMPLING PLAN ADDENDUM
UPPER HUDSON RIVER FLOODPLAINS DATA MANAGEMENT AND EVALUATION

Prepared for

General Electric Company

Albany, New York

Prepared by

Anchor QEA, LLC

305 West Grand Ave, Suite 300

Montvale, New Jersey 07645

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In conjunction with

ARCADIS of New York, Inc.

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Administrative Order on Consent
bgs	below the ground surface
DSR	Data Summary Report
FSP	Field Sampling Plan
GE	General Electric Company
GPS	Geographical Positioning System
IDW	Investigation-Derived Wastes
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	Polychlorinated Biphenyl
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Study
SGS	SGS Environmental Services, Inc.
SOP	standard operating procedure
TOC	Total Organic Carbon
UHR	Upper Hudson River
USEPA	United States Environmental Protection Agency

1 INTRODUCTION

This Addendum to the 2008 Upper Hudson River Floodplain Field Sampling Plan (FSP Addendum) has been prepared on behalf of the General Electric Company (GE) to describe the collection of additional data in 2010 to further characterize polychlorinated biphenyl (PCB) concentrations in certain areas of the Upper Hudson River (UHR) floodplains. These areas have been selected based on previous sampling results, and as part of the overall Remedial Investigation/Feasibility Study (RI/FS) for the UHR floodplain. The 2010 floodplain sampling and laboratory analyses will be completed in accordance with this document and the methods and procedures described in the 2008 Upper Hudson River Floodplain Field Sampling Plan (2008 FSP; QEA and ARCADIS 2008) and the 2009 Field Sampling Plan Addendum (2009 FSP Addendum; QEA and ARCADIS 2009).

This data collection effort is not intended to complete the sampling necessary to complete the full RI/FS. Subsequent sampling will be undertaken as appropriate and necessary for that purpose.[1]

1.1 Field Sampling Plan Addendum Organization

This FSP Addendum is organized as follows:

- **Section One** introduces the FSP Addendum, summarizes the 2008 and 2009 UHR floodplain soil investigations, and presents the objectives of the 2010 sampling activities.
- **Section Two** presents the proposed sample locations for the 2010 sampling program.
- **Section Three** describes the 2010 sampling and analysis activities, including property access procedures, field sampling reconnaissance, sample collection, record keeping, and laboratory procedures.

[1] The activities proposed in this FSP Addendum will be performed by GE, assuming negotiation of an acceptable agreement with the United States Environmental Protection Agency (USEPA). Nothing in this FSP Addendum, however, nor any activity or communication that may be carried out or held in connection with this FSP Addendum is, or should be construed as, any admission of law, fact or liability, as to any matter whatsoever, including but not limited to any response actions for UHR floodplain areas, or for implementation of the RI/FS proposed in this FSP Addendum. GE reserves all of its rights and defenses, including but not limited to rights and defenses under the 1976 settlement signed by GE and duly authorized representatives of the New York State Department of Environmental Conservation (NYSDEC).

- **Section Four** describes the reporting activities associated with the 2010 sampling program.
- **Section Five** presents a preliminary schedule for the activities described in this FSP Addendum.

1.2 Summary of 2009 Investigations

This section describes investigations that were performed in 2009 by GE and USEPA.

- **2009 GE Investigation** – In 2009 GE conducted floodplain sampling in Reaches 1 through 8 as part of the UHR floodplain RI/FS (ARCADIS 2010). The floodplain soil investigation entailed collection and laboratory analysis of 787 soil samples (including quality assurance/quality control [QA/QC] samples) from 261 locations, from July 28 to August 7 and from September 21 to October 2. The sampling locations were reviewed jointly by representatives of GE, USEPA, NYSDEC, and New York State Department of Health (NYSDOH), and were inspected and refined in the field in consultation with representatives from USEPA, NYSDEC and NYSDOH. Additional details related to the 2009 GE floodplain investigation activities are presented in the Final Data Summary Report (DSR), 2009 Floodplain Sampling Activities, Upper Hudson River Floodplains, February 2010 (ARCADIS 2010).

- **2009 USEPA Sampling** – In 2009 USEPA collected 248 soil samples from 88 locations in Reaches 1 through 8 (Rosoff, pers. comm. 2010). The results of the 2009 USEPA sampling activities are tabulated in the DSR (ARCADIS 2010), and details pertaining to the 2009 USEPA investigation are presented in the Revised Sampling Trip Report – Hudson River PCBs (Floodplains) Site, Fort Edward, Saratoga County, New York (Weston Solutions 2010).

1.3 Summary of 2008 Investigations

This section describes investigations that were performed in 2008 by GE and USEPA.

- **2008 GE Investigation** – In 2008 GE conducted floodplain sampling in Reaches 1 through 8 as part of the UHR floodplain RI/FS (ARCADIS 2009). The floodplain soil investigation entailed collection and laboratory analysis of 2,236 soil samples (including QA/QC samples) from 1,019 locations, from September to December. The soil sampling locations were selected in consideration of local topography, observed land use, and vegetation type. The sampling locations were reviewed jointly by

representatives of GE, USEPA, NYSDEC, and NYSDOH, and inspected and refined in the field in consultation with representatives from USEPA, NYSDEC and NYSDOH. Additional details related to the 2008 GE floodplain investigation activities are presented in the Final Data Summary Report (DSR), 2008 Floodplain Sampling Activities, Upper Hudson River Floodplains, June 2009 (ARCADIS 2009).

- **2008 USEPA Sampling** – In 2008 USEPA collected 153 soil samples from 57 locations in Reaches 1 through 8 (Weston Solutions 2009). The results of the 2008 USEPA sampling activities are tabulated in the DSR (ARCADIS 2009), and details pertaining to the 2008 USEPA investigation are presented in the Revised Sampling Trip Report – Hudson River PCBs (Floodplains) Site, Fort Edward, Saratoga County, New York (Weston Solutions 2009).

1.4 2010 Field Sampling Program Objectives

The overall objective of this investigation is to collect data in support of the UHR Floodplain RI/FS. Additionally the data will be used where appropriate to assist in the evaluation of short-term response actions on select sites. The specific data quality objective of the 2010 field sampling program is to characterize floodplain soil PCB concentrations in certain newly identified potential human use areas.

2 SAMPLING DESIGN

This section describes the rationale for selecting the 2010 floodplain sampling locations and identifies the proposed number of samples to be collected.

2.1 Sample Location Selection

Sampling locations have been selected for the 2010 sampling program in areas that have been newly identified as having a potential for human use. If access is not obtained for a particular property the locations for that property will be eliminated. Alternate locations to replace eliminated properties will not be considered for sampling in 2010.

2.2 Proposed Sample Locations

A total of 86 sample locations are proposed for the 2010 sampling activities, as summarized in Table 2-1 below.

Table 2-1
Proposed Numbers of Locations and Samples by River Reach

River Reach	Total Targeted Sample Locations	Targeted Samples		Total Targeted Samples 2010
		0 – 6 and 6 - 12 in. bgs	12 – 24 in. bgs	
8	17	34	8	42
7	3	6	2	8
6	-	-	-	-
5	19	38	10	48
4	14	28	7	35
3	4	8	2	10
2	16	32	8	40
1	13	26	7	33
Total	**86**	**172**	**44**	**216**

The 2010 sampling locations have been selected in consultation with USEPA, NYSDEC, and NYSDOH. The locations of previous and currently proposed samples are presented in Figures 2-1 through 2-8. To ensure that the samples are collected on the targeted properties, the proposed sample 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 to ensure that samples are collected on the targeted property. Final sampling locations will be determined in the field based on discussions among GE, USEPA, NYSDEC, and NYSDOH during the field reconnaissance activities as described in Section 3.2.

3 2010 FLOODPLAIN SAMPLING ACTIVITIES

This section provides the protocols that will be followed for the 2010 floodplain sampling activities for property access, field survey and sample stake-out, sample location inspection, soil sample collection, sample processing, and laboratory analyses. QA/QC activities and procedures are presented in the 2008 FSP.

The 2010 field sampling activities will be initiated approximately three weeks following the conclusion of all written and verbal communications with property owners regarding access. (See Section 5.0 for additional details).

3.1 Property Access

Access must be granted prior to conducting any field activities on the respective property.

For properties targeted for sampling in 2010, GE will use its best efforts to obtain site access and sampling permission from the respective property owners of all tax parcels containing proposed sample locations, but GE will not be required to provide payment to property owners in order to obtain access. GE will attempt to obtain site access and sampling permission not only for its authorized representatives, but also for USEPA, NYSDEC, NYSDOH, and their contractors and oversight officials.

In an effort to obtain access to sample properties targeted for sampling in 2010, an initial mailing containing the access agreement form will be sent within one week of USEPA approval of this FSP addendum and execution of an Administrative Order on Consent (AOC).

Approximately 10 days following the initial mailing, GE will attempt to contact (via telephone) property owners that have not responded to the initial mailing to obtain the signed access forms. If GE is unsuccessful in contacting the targeted property owner or the property owner is nonresponsive to GE's second attempt to obtain access, a final telephone call will be made within one week of the initial telephone call. If after GE's third attempt to contact the property owner, the property owner refuses access, seeks payment from GE, or is non-responsive to GE's attempts to obtain access as described above, GE shall notify USEPA.

At its discretion, USEPA may seek access from such property owners. Should owners of properties targeted for sampling in 2010 refuse to provide access for sampling, or are unresponsive to property access outreach efforts by GE and USEPA, the respective property will be removed from consideration for sampling in 2010.

Copies of all signed access agreements will be provided to USEPA upon request. GE will also provide weekly updates to USEPA on properties with non-responsive or non-cooperative owners, as part of the effort between GE and USEPA to coordinate access.

3.2 Survey, Stake-Out and Sample Location Inspection Activities

For the 2010 sampling program, all field activities (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 from GE will survey and stake-out the proposed sampling locations (as well as any previous sampling locations as applicable and appropriate). The surveying will be performed using either survey-grade GPS or conventional survey equipment. Additionally, the field sampling crew will be equipped with a GPS unit (Trimble GEO XH or similar) with sufficient accuracy (e.g., within 1 foot) to locate and verify property boundaries. The appropriate data layers (e.g., aerial photographs, property tax maps) will be uploaded to the GPS unit as necessary to determine approximate property boundaries enabling the field crews to verify that the targeted property is sampled. 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.

Once the sample locations have been staked out, GE and the USEPA representatives will review the proposed sample locations in the field. The representatives will make a determination as to whether any of the proposed locations should be moved or eliminated, or whether additional locations should be added. The criteria for moving sample locations will be site topography/targeted elevation, the representativeness of the proposed locations relative to the locations of perceived human use areas, the presence of subsurface utilities (if any) or other at-grade structures, and/or property–specific information provided by the respective property owner/user. Both GE and the USEPA will have a representative present

during all of the sample location inspections, who has decision-making authority to add, move, or exclude sample locations.

Following the above field reconnaissance procedures, final sample locations will be documented using a survey-grade GPS unit (or conventional survey equipment), and sample elevation will be recorded.

As described above, sampling locations may be moved, added, or excluded based on field observations and discussions during the field reconnaissance with USEPA. Any such changes will be documented, including the reason(s) for sample relocation, addition, or elimination. All documentation of the moved, added, or eliminated locations will also be uploaded to the field database to ensure that location changes will be accurately tracked. The final sample location coordinates, as agreed upon by GE and USEPA, will also be uploaded to the UHR Floodplains Field Database (Field Database) on a daily basis. Prior to leaving each sampling site, representatives from GE and the USEPA 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 2010 floodplain sampling activities.

3.3.1 Sample Collection Methods and Equipment

The 2010 floodplain soil samples will be collected from the locations depicted on Figures 2-1 through 2-8 using a Macro-Core™ sampling device 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 (i.e., 2 feet below the ground surface [bgs]). If refusal is encountered before reaching the targeted sampling depth, two additional attempts will be made within three feet of the original sample location. 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. The hand auger will be utilized to attempt to collect the soil samples from the

targeted depth intervals. The 0- to 6-inch sample depth interval and 6- to 12-inch sample depth interval will be containerized separately. Soil obtained from the 12- to 18-inch and 18- to 24-inch sample depth interval will be containerized together to represent the 12- to 24-inch sample interval. The recovered soil will be placed into aluminum sampling pans, covered and 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. Once extracted, the recovered soil cores 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 pertaining to the nature and condition of the ground surface at each soil sampling location will be recorded in the field logbook. Logbook entries may include statements such as: disturbed soils, evidence of erosion or deposition, evidence of cultivation, riparian vegetation, grassland, etc. In addition, photographs documenting the sample locations relative to other site features will also be taken.

3.3.2 Sample Core Processing

At the sample processing area, the soil cores will be opened and visually characterized. Observations relative to the soil type (e.g., gravel, coarse sand, fine sand, etc.) and grain size characteristics (e.g., size, sorting, texture, etc.) will be noted. Other observations, including sedimentary structures, organic matter, and moisture will also be documented, as appropriate. The soil cores will be described using the following designations: Primary, Some, Little, and or Trace types of grain sizes present. The soil observations for each sample depth increment, as well as the sample penetration depth and sample recovery, will be entered into the Field Database for upload into the UHR Floodplain Data Management System (UHR Floodplain DMS).

Once the cores are visually characterized and observations are logged into the Field Database, the soil cores will be segmented into 0 to 6 inch and 6 to 12 inch bgs depth intervals. Samples will then be processed in accordance with the Soil Core Processing

standard operating procedure (SOP) provided in Appendix A of the 2009 FSP Addendum (Anchor QEA and ARCADIS 2009). Additionally, approximately 50% of the locations will be sampled at the 12 to 24 inch bgs interval. The number of samples to be collected from the 12 to 24 inch bgs interval is summarized on Table 2.1

The entire sample depth interval will be placed in an aluminum sampling pan and mixed thoroughly to obtain a homogeneous sample. Debris and rocks greater than ½-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 SGS Environmental Services, Inc. (SGS) for analysis for PCBs and total organic carbon (TOC) in accordance with USEPA SW846Method 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 SGS.

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 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 quality control samples (blind duplicates, matrix spikes and matrix spike duplicates at a rate of one per twenty samples, and field blanks at a rate of one per day or one per twenty 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 4.0 of the 2008 FSP.

3.3.3 Containerization, Staging and Management of Investigation-Derived Wastes (IDW)

Excess soil, disposable sampling equipment, used personal protective equipment, and decontamination water and debris generated during the 2010 field sampling activities will be containerized in 55-gallon drums. The drums will be labeled appropriately based on their contents and will be staged temporarily for subsequent waste profiling, transportation, and off-Site disposal, as appropriate. Waste disposal documentation will be retained and included in the 2010 Data Summary Report, described in Section 4.

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 2010 field sampling activities.

4.1 Weekly Project Teleconference Calls

Following initiation of the property access activities described in Section 3.1, GE will initiate weekly or as needed project teleconference calls with USEPA, NYSDEC, and NYSDOH. The purpose of these teleconference calls will be to discuss the progress to date, upcoming scheduled activities, any issues related to property access, and to facilitate the timely exchange of information between GE and the regulatory agencies. These project teleconference calls will be held throughout the duration of the property access outreach and field sampling activities.

4.2 Monthly Progress Reports

Through the duration of the 2010 field sampling activities, GE will prepare Monthly Progress Reports to describe the activities completed. The Monthly Progress Reports will be initiated upon USEPA approval of this FSP Addendum and the AOC, and will continue through submittal of a draft DSR to USEPA. 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 reporting period
- Other information related to the progress of the work
- Project percent complete
- A description of any delays encountered or anticipated, and efforts to mitigate those delays

4.3 Data Summary Report

Within 90 days following receipt of all hard-copy analytical results from the laboratory, a Draft DSR will be submitted to USEPA to present the results of the 2010 field sampling activities. Supporting data, including figures containing all data collected as part of the

project to date, data summary tables, laboratory analytical reports, data verification and validation reports, and waste disposal documentation (if available) will be presented in the Draft DSR. Within 30 days following receipt of final written comments from USEPA on the Draft DSR, a Final DSR will be submitted to USEPA that addresses USEPA's comments on the Draft DSR.

5 SCHEDULE

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

Table 5-1
Project Schedule

Activity	Timeframe/Comments
Initiate property access outreach	Within 7 days of USEPA approval of this FSP Addendum and execution of the AOC.
Initiate field survey, sample location inspection, and sample collection	Within 21 days following receipt of all responses (granted or denied) to the property access outreach effort. Although it is anticipated that sampling will be complete well before December 15, sampling will be stopped by December 15, 2010 or sooner if weather conditions do not allow fieldwork to be conducted.
Laboratory Data Validation	Data validation will be completed within 45 days following receipt of the last hard-copy data package from the laboratory.
Submit Draft Data Summary Report	Within 90 days following receipt of the last hard-copy data package from the analytical laboratory.
Submit Final Data Summary Report	Within 30 days following receipt of final written comments from the USEPA on the Draft DSR.

6 REFERENCES

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