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**PHASE 2 DREDGING CONSTRUCTION QUALITY  
CONTROL/QUALITY ASSURANCE PLAN FOR 2014**

**Appendix A**

**To**

**Remedial Action Work Plan for  
Phase 2 Dredging and Facility Operations in 2014**

**HUDSON RIVER PCBs SUPERFUND SITE**

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*Prepared for:*

**GENERAL ELECTRIC**

**319 Great Oaks Boulevard  
Albany, New York 12203**

*Prepared by:*

**PARSONS**

GE Company – Parsons Project Office  
381 Broadway, Bldg 40-2  
Fort Edward, NY 12828

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**ACRONYMS AND ABBREVIATIONS**

|          |  |
|----------|--|
| ASTM     | American Society for Testing and Materials                   |
| CD       | Consent Decree   |
| CM       | Construction Manager   |
| CQAO     | Construction Quality Assurance Officer                       |
| CU       | Certification Unit   |
| cy       | Cubic yard   |
| DQAP     | Dredging Construction Quality Control/Quality Assurance Plan |
| DGPS     | differential global positioning system                       |
| D&FO     | Dredging and Facility Operations                             |
| EPA      | United States Environmental Protection Agency                |
| FDR      | Final Design Report  |
| FI       | Field Inspector  |
| FRA      | Federal Railroad Administration                              |
| GE       | General Electric Company                                     |
| GPS      | Global Positioning System                                    |
| HPPSC    | Habitat Planting and Plant Supply Contractor                 |
| NYCRR    | New York Codes and Regulations                               |
| NYSDOT   | New York State Department of Transportation                  |
| PCB      | Polychlorinated biphenyl                                     |
| PFOC     | Processing Facility Operations Contractor                    |
| PSCP     | Performance Standards Compliance Plan                        |
| QA       | Quality assurance  |
| QC       | Quality control  |
| QC/QA    | Quality control and quality assurance                        |
| RA       | Remedial Action  |
| RAM QAPP | Remedial Action Monitoring Quality Assurance Project Plan    |
| RAWP     | Remedial Action Work Plan                                    |
| ROD      | Record of Decision   |
| RTK DGPS | Real Time Kinematic Differential Global Positioning System   |
| RYOC     | Rail Yard Operations Contractor                              |

**ACRONYMS AND ABBREVIATIONS  
(CONTINUED)**

|      |                                |
|------|--------------------------------|
| SOW  | Statement of Work              |
| SVOC | Semi-volatile organic compound |
| TAL  | Target Analyte List            |
| TCL  | Target Compound List           |
| TOC  | Total organic carbon           |
| TSCA | Toxic Substances Control Act   |
| VOC  | Volatile organic compound      |

# SECTION 1

## INTRODUCTION

In 2005, the General Electric Company (GE) and the United States Environmental Protection Agency (EPA) executed a Consent Decree (CD) relating to the performance of the Remedial Action (RA) selected by EPA to address polychlorinated biphenyls (PCBs) in sediments of the Upper Hudson River, located in New York State, through dredging, as described in EPA's February 2002 Record of Decision (ROD) for the Hudson River PCBs Superfund Site. The CD was filed in federal district court on October 6, 2005 and was approved and entered by the court as a final judgment on November 2, 2006, when it went into effect.

In accordance with the ROD and the CD, the RA was to be conducted in two phases. Phase 1 was defined as the first year of dredging and was conducted by GE in 2009 (with habitat replacement/reconstruction in Phase 1 dredge areas completed in 2011). Phase 2 consists of the remainder of the dredging project. The CD provided that, following the completion of Phase 1 dredging and a peer review process, EPA would issue a decision regarding the performance standards and scope for Phase 2, and GE would notify EPA as to whether it would perform Phase 2 under the CD. EPA issued its decision regarding the performance standards and scope for Phase 2 in December 2010; and GE notified EPA (also in December 2010) that it elected to perform Phase 2 under the CD.

The CD includes, as Appendix B, a Statement of Work (SOW) for Remedial Action and Operations, Maintenance and Monitoring, which sets forth a number of general requirements for the RA and includes several attachments specifying requirements for various aspects of the RA. EPA issued revised versions of the SOW and its attachments for Phase 2 in December 2010. For the work to be performed in each construction year of Phase 2, Section 3.1 of the revised SOW requires GE to submit a Remedial Action Work Plan (RAWP) for Phase 2 Dredging and Facility Operations (D&FO) for such year, along with any remaining design documents (or revisions or addenda to previously approved design documents) for the dredging and related operations to be performed in that year. The revised SOW also specifies a number of specific plans to be included in the Phase 2 RAWP, including a Phase 2 Dredging Construction Quality Control/Quality Assurance Plan (DQAP), which is to describe the quality control and quality assurance (QC/QA) systems that will be established and followed to verify compliance with the technical specifications included in the Phase 2 design for the year in question.

In the spring of 2011, GE submitted the required design documents and work plans for the first year of Phase 2 dredging, known as Phase 2 Year 1. These included a *Phase 2 Dredging Construction Quality Control/Quality Assurance Plan for 2011* (2011 DQAP), which was Appendix A to the RAWP for 2011 and was approved by EPA as part of that RAWP on April 26, 2011. GE conducted Phase 2 Year 1 dredging and associated activities in 2011 (excluding

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habitat construction in areas dredged in 2011, which was initiated in 2012). During the course of that season, GE submitted two addenda to the RAWP, which included modifications to the 2011 DQAP. Addendum #1, submitted on June 21, 2011, included an updated table for the 2011 DQAP and was approved by EPA on July 1, 2011. Addendum #2, submitted on September 2, 2011, included another revised table for the 2011 DQAP and an additional attachment (presenting a standard operating procedure for sampling and analysis of cap isolation material) and was approved by EPA on November 2, 2011.

The revised SOW provides (in Section 3.1) that, for any Phase 2 year after the first year of Phase 2, GE need only submit “any necessary revisions and/or addenda” to a previously approved work plan. In the case of the DQAP, very few changes to the 2011 DQAP were necessary for the dredging to be conducted in 2012 (known as Phase 2 Year 2) and 2013 (known as Phase 2 Year 3). As a result, the Phase 2 DQAPs submitted for 2012 (2012 DQAP) and 2013 (2013 DQAP) incorporated by reference the majority of the 2011 DQAP (including the modifications and additions in the above-referenced addenda) and described only the revisions to that plan that apply to the respective year.

During the course of the 2012 season, GE submitted eight addenda to the 2012 RAWP, two of which included modifications to the 2012 DQAP. Addendum #2, submitted on May 25, 2012, included a revised Table A2-1 of the DQAP to reflect GE’s submittal of the *Phase 2 Transportation and Disposal Plan for 2012*. Addendum #8, submitted on October 26, 2012, included a revised Table A2-2 of the DQAP and a new form to be included in Attachment 3 (i.e, a Backfill and Cap Material Source Inspection Checklist). These addenda were approved by EPA.

During the course of the 2013 season, GE submitted four addenda to the 2013 RAWP, one of which included modifications to the 2013 DQAP. Addendum #1, submitted on June 18, 2013, included a new Table A2-3 of the DQAP for habitat construction inspections and tests. This addendum was approved by EPA.

Again, for the dredging to be conducted in 2014 (Phase 2 Year 4), very few additional changes to the DQAP will be necessary. In this situation, in accordance with the revised SOW, this *Phase 2 Dredging Construction Quality Control/Quality Assurance Plan for 2014* (2014 DQAP) again incorporates by reference the majority of the 2011 DQAP (including the modifications and additions in the 2011 addenda) and describes only the revisions to that plan that apply to 2014. This 2014 DQAP is an appendix to and part of the *Remedial Action Work Plan for Phase 2 Dredging and Facility Operations in 2014* (2014 RAWP). It should be noted that the 2014 RAWP does not cover anticipated operations in the area known as the Landlocked Area in Reach 7 of the River, which are covered by a separate Reach 7 RAWP. However, the provisions of this 2014 DQAP (and the portions of the 2011 DQAP incorporated herein) that apply to dredging in the Landlocked Area are referenced in the Reach 7 RAWP. In addition, any modifications to the procedures set forth or incorporated herein that are necessary for areas near

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existing dams are or will be specified RAWP addenda that apply specifically to the Certification Units (CUs) that contain those areas, as described in the 2014 RAWP.

Each subsequent section of this 2014 DQAP incorporates by reference the comparable section of the 2011 DQAP and identifies any substantive changes from that document. In addition, as a general matter, for purposes of this 2014 DQAP, all references in the 2011 DQAP to the *Phase 2 Final Design Report for 2011* (2011 FDR) should be understood to refer to the *Phase 2 Final Design Report for CU85 through CU96* (CUs 85-96 FDR) or other applicable Final Design Reports covering 2014 activities (as described in the 2014 RAWP); all references in the 2011 DQAP to the 2011 RAWP and its attached plans should be understood to refer to the 2014 RAWP and its comparable attached plans; all references in the 2011 DQAP to the *2011 Remedial Action Monitoring Quality Assurance Project Plan* (2011 RAM QAPP) should be understood to refer to the *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan* (Phase 2 RAM QAPP) submitted in 2012; and all references in the 2011 DQAP to the relevant contracts should be understood to refer to the following contracts for 2014:

- Contract 30 for the operation of the sediment processing facility by the Processing Facility Operations Contractor (PFOC);
- Contract 42A for dredging in the main stem of the river, transport of dredged material to the processing facility, backfilling/capping, and related in-river operations, as well as operation of the Isthmus Transload Area (ITA) in the Lanlocked Area, to be performed by the Dredging Contractor (also referred to in the Reach 7 RAWP as the Isthmus Transload Contractor);
- Contract 42B for dredging in the Landlocked Area of the river, to be performed by the Landlocked Dredging Operations Contractor;
- Contract 53A for supply of submerged aquatic vegetation (SAV) plants by the SAV Habitat Plant Supply Contractor (HPSC) for planting in certain areas dredged in 2012 or 2013;
- Contract 54A for the supply and installation of plants in riverine fringing wetlands (RFW), to be conducted by the RFW Habitat Planting and Plant Supply Contractor (HPPSC) in certain areas dredged in 2012 or 2013; and
- Contract 60 for the operation of the rail yard by the Rail Yard Operations Contractor (RYOC).

In addition, this 2014 DQAP contains two revised attachments – Attachment 1 (DQAP Staffing List and Résumés) and Attachment 2 (Dredging and Facility Operations Test and Inspection Tables) – and one additional form to be included in Attachment 3 (Typical Construction Forms). The remaining attachments are the same as those in the 2011 DQAP, as supplemented by Addendum #2 to the 2011 RAWP (which added Attachment 6 to the DQAP), except that in Attachments 5 (Standard Operating Procedure for Dredging Operations Bathymetric Surveys) and 6 (Standard Operating Procedure for Cap Isolation Material Sampling

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and Analysis for Total Organic Carbon), all references to 2011 and 2011 plans should be considered to refer to 2014 and the comparable 2014 plans.

As in prior years of this project, GE's approach to management of the quality of the RA implementation in 2014 will include an integrated system of quality control (QC) by its contractors and quality assurance (QA) by its Construction Manager (CM), which will be responsible for the day-to-day coordination of QA and QC measures in the field.

**SECTION 2**

**PROJECT QC/QA ORGANIZATION**

This section incorporates by reference Section 2 of the 2011 DQAP, except that: (a) the references to the 2011 D&FO should refer to the 2014 D&FO; and (b) the references to contract numbers should refer to the contract numbers given in Section 1 above.; and (c) Section 2.1.3 is revised as follows:

**2.1.3 Engineers of Record**

The Engineers of Record are independent, duly qualified, licensed design professionals, retained directly by GE to provide design and engineering services in connection with the project. This definition includes all subcontractors to the Engineers of Record.

The Engineers of Record to be used for the dredging and facility operations in 2014 are listed below, together with their roles:

| <b>Organization</b> | <b>Engineer's Certifying Role</b>                             |
|---------------------|---|
| ARCADIS             | 2014 Dredging and Facility Operations<br>(including 2014 FDR) |
| Anchor QEA          | 2014 Habitat Construction                                     |

**SECTION 3**

**SUBMITTALS**

This section incorporates by reference Section 3 of the 2011 DQAP.

**SECTION 4**

**PERFORMANCE MONITORING REQUIREMENTS**

This section incorporates by reference Section 4 of the 2011 DQAP except that the references to the 2011 RAM QAPP and the 2011 Performance Standards Compliance Plan (PSCP) should refer to the Phase 2 RAM QAPP and the 2014 PSCP.

**SECTION 5**

**INSPECTION AND VERIFICATION ACTIVITIES**

This section incorporates by reference Section 5 of the 2011 DQAP, except for changes to the FDR and contract numbers as described in Section 1 above.

**SECTION 6**

**CONSTRUCTION DEFICIENCIES**

This section incorporates by reference Section 6 of the 2011 DQAP.

**SECTION 7**

**DOCUMENTATION**

This section incorporates by reference Section 7 of the 2011 DQAP.

## SECTION 8

### EPA APPROVALS FOR CERTIFICATION UNITS

This section incorporates by reference Section 8 of the 2011 DQAP except for the changes to the cross-references as described in Section 1 above and except for the following revision of Section 8.1:

#### 8.1 CU DREDGING COMPLETION APPROVAL

After the design dredging pass is reported by the Dredging Contractor to be complete within an individual Certification Unit (CU) or portion thereof, GE will provide notification to EPA of the start of the dredging approval process for that CU or portion thereof. The dredging approval process will be initiated by the CM with the collection of bathymetric survey data and sediment cores for laboratory analysis. A multi-beam survey will be performed in accordance with the Standard Operating Procedure for Dredging Operations Bathymetric Surveys (Attachment 5) by the third-party hydrographic survey contractor to document the bathymetric elevations after the design dredging pass. Single-beam or land surveys may be performed in shallow dredge areas. Concurrent with the bathymetric survey, the third-party sediment coring contractor will collect sediment cores in accordance with Section 4 of the Phase 2 RAM QAPP. (It should be noted that, if the CM is able to demonstrate that the Dredging Contractor's bathymetric surveys aligns with the third-party surveyor's bathymetric surveys, the CM may, with EPA's approval, use the Dredging Contractor's confirmatory bathymetric survey and move directly to core collection after the design dredging pass is reported to be complete.)\*

GE will review the results of the bathymetric survey and the sediment sample results with EPA in accordance with Section 4 of the 2014 PSCP to determine the need for and extent of an additional dredge pass. Bathymetric data and sediment sample data will be targeted to be available within five (5) days following the Dredging Contractor's notification of completion of the design dredging pass for EPA review and comment.

Should the bathymetric survey and the results of the residual sediment sampling indicate the need for an additional dredging pass in accordance with the criteria in the 2014 PSCP (Appendix D to the 2014 RAWP), the process for confirmation of the additional dredging pass will be similar to that for the initial dredging pass. Review and confirmation of removal in an additional dredging pass is expected to take approximately five (5) days.

The CM will review the vertical and horizontal limits of removal and the results of the post-dredging sediment sampling within the CU in accordance with the applicable requirements of the 2014 FDR and the 2014 PSCP.

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\* Any modifications to these survey procedures for areas near dams are or will be set forth in RAWP addenda that apply specifically to the CUs containing those areas.

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The CM will complete the CU Dredging Completion Approval Form (included in Attachment 4). This form will also identify the extent of backfilling and/or capping for the CU in accordance with the applicable requirements of the relevant FDR, the 2014 PSCP, and agreements made with EPA during the course of the daily CU acceptance progress meetings.

A completed CU Dredging Completion Approval Form (Form 1), all laboratory data, and supporting drawings will be presented to the EPA staff field representative for review and concurrence. If, after a reasonable period of time allowed for review and comment on GE's completed submittal package, the EPA staff field representative agrees that dredging has been completed and that the specified plan for backfilling and/or capping conforms to the requirements of the above-mentioned documents, then the EPA staff field representative will promptly indicate concurrence by initialing and signing the CU Dredging Completion Approval Form (Form 1).

**SECTION 9**

**FIELD CHANGES**

This section incorporates by reference Section 9 of the 2011 DQAP.

**SECTION 10**

**FINAL QC/QA REPORTING**

This section incorporates by reference Section 10 of the 2011 DQAP, except that: (a) the annual report on 2014 work activities will be submitted within 30 days after completion of dredging, backfilling, capping, shoreline reconstruction/stabilization, sediment processing, and off-site transport of processed sediments for that season; and (b) that annual report will include the documentation specified in Section 5.5 of the 2014 PSCP.