REMEDIAL ACTION WORK PLAN FOR PHASE 2 DREDGING AND FACILITY OPERATIONS IN 2015

HUDSON RIVER PCBs SUPERFUND SITE

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ACRONYMS AND ABBREVIATIONS

ARARs	Applicable or relevant and appropriate requirements
CAMs	Corrective Action Memoranda
CD	Consent Decree
CDE	Critical Phase 2 Design Elements (Attachment A to SOW)
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfs	cubic feet per second
CFR	Code of Federal Regulations
CHASP	Community Health and Safety Plan
CM	Construction Manager
CU	certification unit
cy	cubic yard
D&FO	Dredging and Facility Operations
DBH	diameter at breast height
DGPS	differential global positioning system
DoC	Depth of Contamination
DQAP	Dredging Construction Quality Control/Quality Assurance Plan
EHS	environmental health and safety
EPA	United States Environmental Protection Agency
EPS	Engineering Performance Standards
FDR	Final Design Report
ft	foot / feet
GE	General Electric Company
GPS	global positioning system
HASP	Health and Safety Plan
MPA	mass per unit area
NYSCC	New York State Canal Corporation
NYSDEC	New York State Department of Environmental Conservation
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
PAP	Property Access Plan

ACRONYMS AND ABBREVIATIONS (CONTINUED)

PCBs	polychlorinated biphenyls
PFOC	Processing Facility Operations Contractor
PPE	personal protective equipment
PSCP	Performance Standards Compliance Plan
QA	quality assurance
QC	quality control
QoLPS	Quality of Life Performance Standards
RA	Remedial Action
RA CHASP	Remedial Action Community Health and Safety Plan
RA HASP	Remedial Action Health and Safety Plan
RAM QAPP	Remedial Action Monitoring Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
RBLA	Rensselaer Barge Loading Area
RFW	Riverine Fringing Wetland
RM	River Mile
ROD	Record of Decision
RTK	Real Time Kinematic
RYOC	Rail Yard Operations Contractor
SAV	Submerged (and floating) Aquatic Vegetation
SBLA	Saratoga Barge Loading Area
SOW	Statement of Work for Remedial Action and Operations, Maintenance and Monitoring
TDP	Transportation and Disposal Plan
TID	Thompson Island Dam
TIP	Thompson Island Pool
TOC	total organic carbon
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
WQ Requirements	Substantive Water Quality Requirements

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 (EPA 2002). The CD was filed in federal district court on October 6, 2005 (USEPA/GE, 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 activities 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. After an intensive peer review process, 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, by February 15 of that year (or such alternate date as is agreed to by GE and EPA), a Remedial Action Work Plan (RAWP) for Phase 2 Dredging and Facility Operations for such year, along with any remaining design documents (or revisions or addenda to previously approved design documents) for the dredging to be performed in that year.

In the spring of 2011, 2012, 2013, and 2014 in accordance with the revised SOW, GE submitted the required reports and work plans for, respectively, the first year of Phase 2 dredging (known as Phase 2 Year 1), the second year of Phase 2 dredging (known as Phase 2 Year 2), the third year of Phase 2 dredging (known as Phase 2 Year 3) and the fourth year of Phase 2 dredging (known as Phase 2 Year 4). GE conducted Phase 2 Year 1 dredging and associated activities in 2011, Phase 2 Year 2 dredging and associated activities in 2012, Phase 2 Year 3 dredging and associated activities in 2013, and Phase 2 Year 4 dredging and associated activities

in 2014 (excluding, in each case, habitat construction in areas dredged in those years, which has been or will be performed in subsequent years). The Phase 2 work performed in those years is summarized in GE's Phase 2 Year 1 Annual Progress Report (Parsons, 2012), Phase 2 Year 2 Annual Progress Report (Parsons, 2013a), Phase 2 Year 3 Annual Progress Report (Parsons, 2014a) and Phase 2 Year 4 Annual Progress Report (Parsons, 2015e).

The Phase 2 dredge areas that remain to be dredged consist of the following: Certification Unit (CU) 60 in Reach 8 of the river near the Thompson Island Dam; portions of the non-navigable portion of the river, known as the Landlocked Area located in Reach 7, where dredging was not completed in 2014 (namely, portions of CUs 64 and 65 and all of CU 66); CUs 94-96 in Reach 3; and portions of CU 99 in Reach 1 that were not dredged in 2014. This *Remedial Action Work Plan for Phase 2 Dredging and Facility Operations in 2015* (2015 RAWP), which has been revised from prior versions, constitutes GE's RAWP for the dredging to be performed in those remaining Phase 2 dredge areas, with the exception of certain areas that are covered by separate RAWPs.[1] Specifically, this 2015 RAWP covers dredging and related operations in CUs 94-96 and the portions of CU 99 that were not dredged in 2014. It does not cover dredging in CU 60 due to its very close proximity to Thompson Island Dam. That CU is covered by a separate *Phase 2 Remedial Action Work Plan for Certification Unit 60* (CU 60 RAWP; Parsons, 2015a). Additionally, this RAWP does not cover dredging in the remaining portions of the Landlocked Area, which are covered by the separate *Phase 2 Remedial Action Work Plan for Reach 7 – Landlocked Area* (Reach 7 RAWP), submitted in 2014 (Parsons, 2014b), and Addendum No. 1 to that RAWP (Parsons, 2015b).

For two sub-units of CU 95, designated CU 95-2 and CU 95-3, this RAWP presents a combined water-based and land-based approach. This approach was developed because these areas have restricted access due to bedrock that creates shallow water depths and thus precludes access to the dredge areas from both the north and south access channels with large equipment and vessels.

In addition, this RAWP describes the habitat construction activities to be performed in 2015 in certain areas that were dredged in 2014 (and, in one area, 2015).

As discussed further below, this RAWP includes several appendices, and references certain other documents, providing additional information on GE's plans for dredging and facility operations. This RAWP is also supported by a number of Phase 2 Final Design Reports (FDRs) and supplements, identified in Section 2 below, which provide GE's design plans for the dredging in the remaining Phase 2 CUs. Except as otherwise noted, all references in this 2015 RAWP to dredging and associated activities to be performed in 2015 relate to operations other than those covered specifically by the separate Reach 7 RAWP and CU 60 RAWP.

[1] This version of the main text of the 2015 RAWP has been revised from versions submitted in February 2015 and again in April 2015 to reflect comments from and discussions with EPA regarding those prior versions.

1.1 PROJECT SETTING

The Upper Hudson River is defined as the section of river from Fenimore Bridge in Hudson Falls to the Federal Dam at Troy, New York. The ROD called for, among other things, a remedial action to remove and dispose of sediments containing PCBs from the Upper Hudson River. Sediments to be removed are defined based on the PCB mass per unit area (MPA) and surface concentration criteria (see EPA, 2002).

The ROD defined three sections of the Upper Hudson River for the sediment remediation activities:

- River Section 1: Former location of Fort Edward Dam to Thompson Island Dam (TID) (from river mile [RM] 194.8 to RM 188.5; approximately 6.3 RM);
- River Section 2: TID to Northumberland Dam (from RM 188.5 to RM 183.4; approximately 5.1 RM); and
- River Section 3: Northumberland Dam to the Federal Dam at Troy (from RM 183.4 to RM 153.9; approximately 29.5 RM).

As noted above, the ROD called for this remedial action to be conducted in two phases. Phase 1 dredging, completed in 2009, was conducted in a portion of River Section 1. Phase 1 also included construction of a land-based sediment processing facility adjacent to the Champlain Canal. Phase 2 covers the remaining dredging in all three river sections. The work addressed in this 2015 RAWP will consist of dredging in the remaining Phase 2 dredge areas in River Section 3.

1.2 2015 PHASE 2 CONTRACTS

The project scope for the 2015 Phase 2 activities addressed in this 2015 RAWP will be conducted under four separate primary contracts, Contracts 30, 42A, 53A, and 60, described below:

- Contract 30 – Processing Facility Operations, covers sediment processing facility operations and maintenance, including barge unloading, coarse material separation, sediment dewatering, loading of debris, coarse material and dewatered sediment into empty rail cars, treatment of process water and storm water, site storm-water management, and staging area management and maintenance. The contractor selected to carry out these activities under Contract 30 is referred to as the Processing Facility Operations Contractor (PFOC) throughout this 2015 RAWP.
- Contract 42A – Dredging Operations, covers shoreline vegetation pruning, dredging operations, the transport of loaded sediment barges to the sediment processing facility, supply and placement of appropriate backfill or cap materials, performance of appropriate shoreline stabilization measures, planting of submerged aquatic and floating vegetation (SAV) by divers and repair and planting of shoreline areas above the

designated shoreline elevation contour if disturbed during dredging operations. The contractor selected to carry out these activities under Contract 42A is referred to herein as the Dredging Contractor.

- Contract 53A – Habitat Planting and Plant Supply, covers supply of both SAV and RFW plants and the planting of RFW plants in certain areas dredged in 2014 (and, in one area, 2015). The contractor selected to carry out this contract will supply SAV and RFW plants and install RFW plants and is referred to herein as the Habitat Contractor.
- Contract 60 – Rail Yard Operations, covers all activities required to operate and maintain the rail yard. These will primarily involve setting up of outbound loaded trains, and receiving inbound empty trains. The contractor selected to perform these activities under Contract 60 is referred to herein as the Rail Yard Operations Contractor (RYOC).

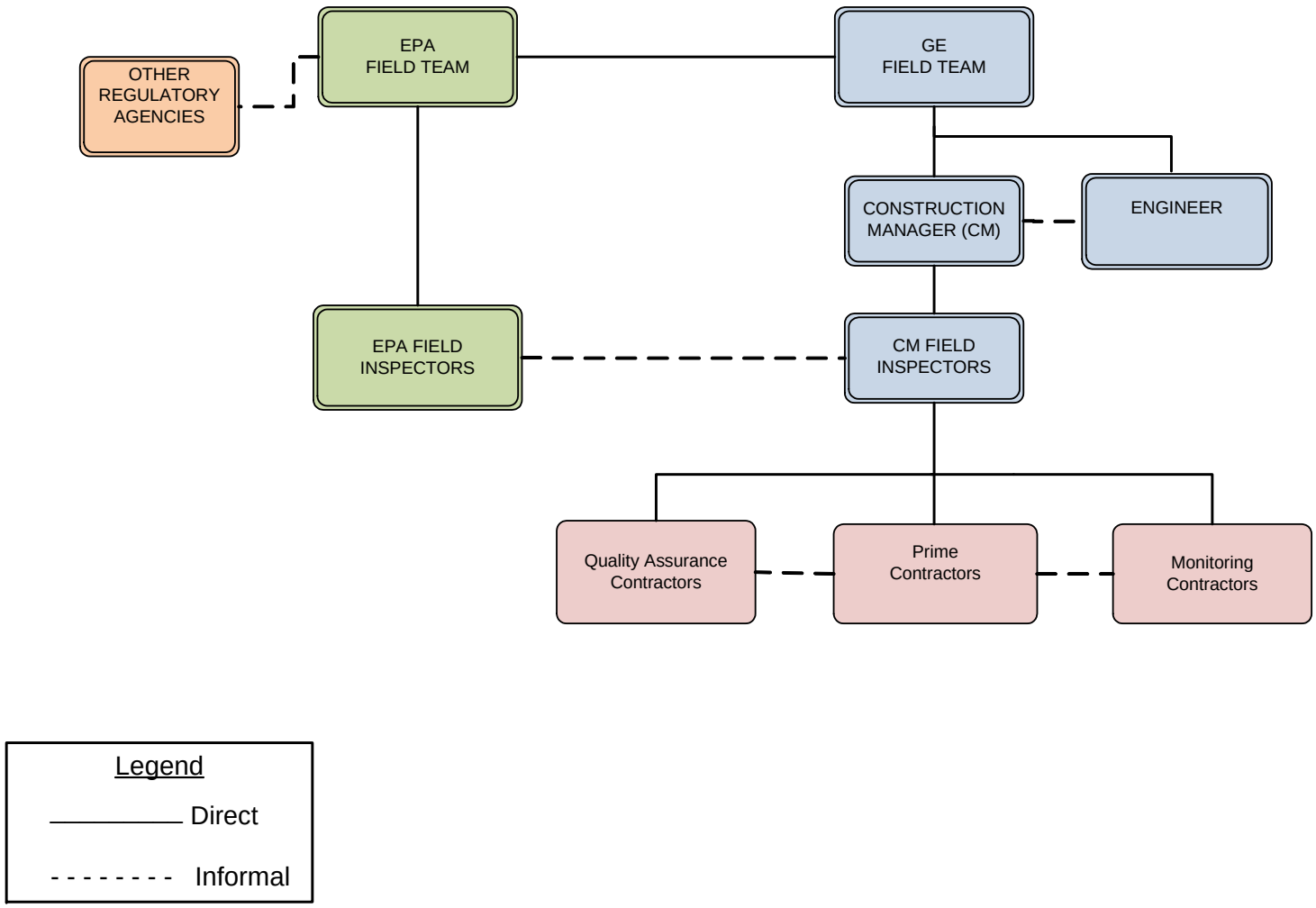
These activities are referred to collectively herein as the 2015 Dredging & Facility Operations (2015 D&FO). In addition to the specific contractors described above, Parsons Engineering of New York, Inc. (Parsons) will provide construction management services to GE during the 2015 D&FO. Parsons is referred to as the Construction Manager (CM) throughout this 2015 RAWP. Figure 1-1 provides a chart that shows the lines of communication between the different groups involved in the project.

1.3 2015 RAWP AND ASSOCIATED DOCUMENTS

This 2015 RAWP consists of the main text and several appendices containing other specific plans, as further described below. In addition, a *Phase 2 RA Health and Safety Plan for 2015* (2015 RA HASP) has been provided separately (Parsons, 2015c). These documents have been developed to be consistent with the revised versions of the SOW and its attachments issued by EPA for Phase 2 in December 2010, with certain clarifications and modifications based on discussions with EPA. Those SOW attachments include a document titled *Critical Phase 2 Design Elements* (Phase 2 CDE, Attachment A to the revised SOW), a *Phase 2 Remedial Action Monitoring Scope* (Phase 2 RAM Scope, Attachment B to the revised SOW), a *Phase 2 Performance Standards Compliance Plan Scope* (Phase 2 PSCP Scope, Attachment C to the revised SOW), and a *Phase 2 Remedial Action Community Health and Safety Program Scope* (Phase 2 RA CHASP Scope, Attachment D to the revised SOW).

The plans provided in the appendices to this RAWP (described below) apply generally to the 2015 activities in the CUs covered by this RAWP. In addition, although the Landlocked Area and CU 60 are covered by separate RAWPs, the plans provided in these appendices also apply to those areas and are thus referenced and incorporated in the Reach 7 RAWP and CU 60 RAWP with the exceptions and modifications noted therein.

Figure 1.1 Project Lines of Communication



2015 RAWP (main text) – provides a description of the dredging and associated operations to be performed during the 2015 season of Phase 2 in CUs 94-96 and CU 99, including a description of the equipment staging for those dredging operations and a description of the combined land- and water-based approach to dredging in CUs 95-2 and 95-3. It also provides a description of the habitat construction activities to be performed in 2015 in previously dredged areas. Further, it includes a construction schedule and a dredge production schedule for 2015.

Appendix A: ***Phase 2 Dredging Construction Quality Control/Quality Assurance Plan for 2015*** **(2015 DQAP) –** provides a description of the quality control and quality assurance (QC/QA) systems that will be established and followed by GE to verify compliance with the approved technical specifications included in the applicable Phase 2 FDRs as approved by EPA. Since very few changes to the *Phase 2 Dredging Construction Quality Control/Quality Assurance Plan for 2011* (2011 DQAP) will be necessary for the dredging to be conducted in 2015, the 2015 DQAP, like the 2012, 2013 and 2014 DQAPs, incorporates by reference the majority of the 2011 DQAP (including certain addenda submitted in prior years); and it describes only the revisions to that plan that apply to 2015. The QC/QA program described in the DQAP applies to the sediment processing facility operations, the dredging operations, the habitat construction, and the rail yard operations.

Appendix B: ***Phase 2 Facility Operations and Maintenance Plan for 2015*** **(2015 Facility O&M Plan) –** provides the following: (a) a description of the operation and maintenance of the sediment processing facility to be used by GE (including all aspects of the sediment processing operations); (b) a description of manpower requirements; (c) a contingency plan for unplanned maintenance of critical equipment; (d) a description of worker health and safety measures, decontamination procedures for personnel and equipment, spill control and response measures, and contractor noise and light monitoring to be implemented at the sediment processing facility; and (e) a description of the shut-down procedures to be performed at the conclusion of the dredging season and the maintenance activities to be undertaken at the facility during the off-season. Since very few changes to the *Phase 2 Facility Operations and Maintenance Plan for 2013* (2013 Facility O&M Plan) will be necessary for the activities to be conducted in 2015, the 2015 Facility O&M Plan incorporates by reference the majority of the 2013 Facility O&M Plan, and it describes only the revisions to that plan that apply to 2015.

Appendix C: ***Phase 2 Transportation and Disposal Plan*** **(TDP) (not included) –** describes the transport and disposal of dewatered sediments and debris, including a description of the wastes and materials to be transported, the procedures to be followed in characterizing and handling the dredged material for purposes of transport and disposal, the means of transport, the waste destinations, sampling of waste materials for transport and disposal purposes, loading procedures, and the record-keeping associated with the transport and disposal of the waste and materials. Since EPA has not approved the approach described in the 2014 TDP provided in the 2014 RAWP (Parsons 2014c), GE will continue to follow the 2013 TDP, which was Appendix C to the 2013 RAWP (Parsons, 2013b), during the 2015 season.

Appendix D: ***Phase 2 Performance Standards Compliance Plan for 2015*** **(2015 PSCP) –** describes the actions that GE will take during the 2015 season of Phase 2 to implement the Engineering Performance Standards (EPS), Quality of Life Performance Standards (QoLPS), and substantive water quality requirements (WQ Requirements) issued (or revised) by EPA for Phase 2 of the RA. Since very few changes to the *Phase 2 Performance Standards Compliance Plan for 2014* (2014 PSCP) will be necessary for the activities to be conducted in 2015, the 2015 PSCP incorporates by reference the majority of the 2014 PSCP, and it describes only the revisions to that plan that apply to 2015.

Appendix E: ***Phase 2 Property Access Plan for 2015*** **(2015 PAP) –** identifies the procedures that GE has followed and will follow to obtain access agreements, leases, easements or title with respect to all properties to which access is needed for purposes of implementing the D&FO work during the 2014 season of Phase 2. Since few changes to the *Phase 2 Property Access Plan for 2012* (2012 PAP) will be necessary for the dredging and associated activities to be conducted in 2015, the 2015 PAP incorporates by reference the majority of the 2012 PAP, and it describes only the revisions to that plan that apply to 2015.

Appendix F: ***Phase 2 Community Health and Safety Plan for 2015*** **(2015 CHASP**) – addresses potential community health and safety issues for the public in the vicinity of the work to be performed in the 2015 season of Phase 2. This plan describes potential hazards and impacts to members of the local community, and the steps that GE and its contractors will take to prevent and respond to them.

Phase 2 Remedial Action Health and Safety Plan for 2015 **(2015 RA HASP)** (provided separately) **–** constitutes an updated version of the RA HASP that was previously submitted to and reviewed by EPA for prior years of Phase 2. The 2015 RA HASP (Parsons, 2015c) addresses potential worker health and safety issues for GE and its contractors' workers in the course of the the 2015 season of Phase 2. The 2015 RA HASP describes potential hazards and impacts to project workers, and the steps that GE and its contractors will take to prevent and respond to them.

In addition, although not included in the 2015 RAWP submittal, the *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan* (Phase 2 RAM QAPP; Anchor QEA, 2012) is an integral work plan to the 2015 D&FO. The Phase 2 RAM QAPP, submitted to EPA in 2012, was designed to be used for the remainder of Phase 2, and any necessary revisions or updates to that plan for subsequent years have been and will be submitted to EPA in Corrective Action Memoranda (CAMs). That document (with any changes specified in CAMs) describes in detail the monitoring and sampling activities (including sample collection, analysis, and data handling activities) to be conducted by GE during the remaining years of Phase 2, including 2015.

Finally, it should be noted that the demobilization and restoration of the sediment processing facility are described in GE's separate *Phase 2 Sediment Processing Facility Demobilization and Restoration Plan* (Arcadis, 2015b).

1.4 DELIVERABLE REQUIREMENT INDEX

The 2015 RAWP submittal has been developed pursuant to Sections 3.1.1 (2015 RAWP) and 3.1.3 (2015 RA HASP) of the 2010 revised SOW attached to the CD. Table 1-1 provides an index specifying where each pertinent requirement of the revised SOW is addressed.

Table 1-1 SOW/2015 RAWP Cross-Reference Table

Requirement	Citation	2015 RAWP Location
Detailed description of major remediation and construction activities	SOW Section 3.1.1 (page 3-17), cross-referencing Section 2.3.2.2 of the SOW	Section 2 describes dredging and processing facility operations; Section 3 describes anticipated 2015 habitat construction in certain previously dredged areas; the 2015 Facility O&M Plan in Appendix B describes the processing facility operations in more detail; and the 2013 TDP (to be followed in 2015) describes rail yard operations and waste characterization, handling, transport, and disposal procedures.
Monitoring events and compliance monitoring	Same as above	Compliance monitoring is described in detail in the Phase 2 RAM QAPP. It is summarized in the 2015 PSCP in Appendix D and in Section 5 of this 2015 RAWP. Monitoring to be carried out by contractors for construction/operation purposes is discussed in Section 6 and, for the PFOC and RYOC, in the 2015 Facility O&M Plan in Appendix B.
Construction QA procedures	Same as above	The 2015 DQAP in Appendix A
Equipment staging	Same as above	Section 2 describes dredging equipment staging and Section 3 describes habitat construction equipment staging.
Construction schedule	Same as above	Section 4 provides a construction schedule for 2015.
Phase 2 Dredging Construction Quality Assurance Plan	Same as above	The 2015 DQAP in Appendix A
Phase 2 Performance Standards Compliance Plan	Same as above	The 2015 PSCP in Appendix D
Phase 2 Property Access Plan	Same as above	The 2015 PAP in Appendix E

Table 1-1 SOW/2015 RAWP Cross-Reference Table (continued)

Requirement	Citation	2015 RAWP Location
Phase 2 Transportation and Disposal Plan	Same as above	The 2013 TDP (see above discussion in text)
Phase 2 Facility O&M Plan	Same as above	The 2015 Facility O&M Plan in Appendix B
Phase 2 Community Health and Safety Plan	Same as above	The 2015 CHASP in Appendix F
Updates to Phase 1 RA HASP	SOW Section 3.1.3 (page 3-18)	2015 RA HASP (separate, stand-alone document)

1.5 2015 RAWP ORGANIZATION

This 2015 RAWP is organized as follows:

Section 1 – Introduction: provides an introduction and overview of this 2015 RAWP and associated documents, an index specifying where each pertinent requirement of the SOW is addressed, and an outline of the plan's organization.

Section 2 – 2015 Dredging Operations: describes the work to be performed by the Dredging Contractor in CUs 94-96 and 99 pursuant to Contract 42A (Dredging Operations), including: (a) an overview of the dredging operations process; (b) mobilization activities; (c) equipment staging; (d) shoreline vegetation pruning; (e) sheen response and other water quality controls; (f) dredging operations; (g) dredged material transport; (h) anchoring; (i) shoreline stabilization; (j) repair and planting of shoreline areas above the shoreline elevation contour if they are disturbed during dredging operations; (k) placement of backfill and engineered caps; (l) hydrographic surveying during dredging operations; and (m) demobilization activities. This section includes a description of the combined land- and water-based approach to dredging in CUs 95-2 and 95-3.

Section 3 – 2015 Habitat Construction: describes the work to be performed by the Dredging Contractor and the Habitat Contractor in 2015 in certain areas dredged in 2014 (and, in one area, 2015). This work will include: (a) pre-construction and mobilization activities; (b) equipment staging; (c) pre-planting survey; (d) transport of plants; (e) SAV and RFW planting and RFW seeding; (f) plant monitoring events; (g) spring re-planting in the year after initial habitat construction; (h) anchoring; and (i) demobilization activities.

Section 4 – Construction Schedule: presents the construction schedule for the the 2015 D&FO activities and the dredge production schedule, identifying the target monthly volume of *in situ* sediment to be dredged. The target monthly volume of *in situ* sediment to be dredged includes volumes from areas discussed in this 2015 RAWP, the CU 60 RAWP, and Addendum 1 to the Reach 7 RAWP. This section also includes the qualifications and assumptions related to the construction and dredge production schedules and the interfaces between contracts.

Section 5 – Compliance Monitoring: provides a brief overview of the monitoring to be performed by GE during the the 2015 D&FO to assess achievement of the Phase 2 EPS, QoLPS, and WQ Requirements. More details regarding this monitoring are provided elsewhere – mainly in the Phase 2 RAM QAPP.

Section 6 – Health, Safety, and Environmental Protection Measures: discusses: (a) the health and safety policy, program and plan to be implemented during the 2015 D&FO (including general worker health and safety measures); (b) personnel decontamination; (c) spill and storm water pollution prevention and spill and response; (d) emergency contact numbers and (e) the monitoring to be conducted by the PFOC, RYOC, Dredging Contractor, and Habitat Contractor to verify compliance with the contract specifications.

Section 7 – Report on 2015 Activities: describes the annual progress report to be submitted following the conclusion of the 2015 D&FO, as required by the revised SOW.

Section 8 – References: provides bibliographic references to key documents referred to in the body of this 2015 RAWP.

1.6 2015 RAWP SUBMITTAL REVISIONS

Construction activities described herein are based on the design drawings and specifications for Contracts 30, 42A, 53A, and 60, subject to EPA approval. During implementation of the 2015 D&FO, revisions to this 2015 RAWP submittal may become necessary due to design changes, adaptive management changes made pursuant to Section 7 of the 2010 revised SOW, unexpected field conditions, or other reasons. When GE becomes aware that revisions will be necessary, and those revisions affect the approved schedule or alter the means or scope of the work set forth in this 2015 RAWP, GE will notify EPA of the proposed change and seek EPA approval.

SECTION 2

2015 DREDGING OPERATIONS

This section provides a discussion of the RA construction activities associated with the 2015 dredging operations in CUs 94-96 and 99. Dredging operations specific to CUs 95-2 and 95-3 are discussed in Section 2.13; however, details provided in the previous sections of Section 2 contain numerous more general provisions that also apply to activities in those CU 95 sub-units. The activities described in this section center around the dredging of sediment and debris, but also include associated activities such as mobilization and demobilization activities, shoreline vegetation pruning, dredged material transport, anchoring, placement of backfill and engineered caps, and shoreline stabilization.

The planned dredging operations activities are presented in the general chronological order in which they will initially occur. In order to complete the 2015 dredging operations within one construction season, many activities will occur simultaneously with multiple crews.

The dredge areas that are covered by this 2015 RAWP are located in portions of River Section 3 and are covered by separate Final Design Reports (FDRs). Specifically, CU 99 is covered by GE's revised *Addendum No. 2 to the Final Design Report for 2013* (Arcadis, 2013b), and CUs 94 through 96 are covered by GE's *Phase 2 Final Design Report for CU85 through CU96* (CUs 85-96 FDR; Arcadis, 2014a), as supplemented and modified by GE's *Supplemental Design Revisions for 2015* (2015 Design Revisions; Arcadis, 2015a).

The CU areas subject to dredging in 2015 are shown in the Contract Drawings for Contract 42A, which are included in the relevant FDRs:

- Existing Conditions (G-Drawing Series);
- Dredging Operations (D-Drawing Series);
- Isolation Cap (C-Drawing Series); and
- Backfill (B-Drawing Series).

Information regarding sediment processing facility operations, including unloading of dredged materials, dewatering activities, and on-land transport and disposal, is contained in the 2013 Facility O&M Plan, incorporated by reference in the 2015 Facility O&M Plan (Appendix B), and in the 2013 TDP, which will be followed during 2015 (as discussed in Section 1.3).

As noted above, dredging and related sediment handling operations for CU 60 and the remaining dredge areas in the Landlocked Area are not covered by this RAWP or the corresponding FDRs applicable to CUs 94-96 and 99. CU 60 presents a number of distinct operational challenges due to the fact that it is located in very close proximity to the eastern portion of Thompson Island Dam. As a result, dredging in CU 60 is addressed in the separate CU 60 RAWP (Parsons, 2015a), as well as design revisions included in GE's 2015 Design

Revisions (Arcadis, 2015a). Similarly, the Landlocked Area presents a number of operational challenges different from those in the main stem of the river, particularly due to the fact that the Landlocked Area is not directly accessible from the navigable channel of the Hudson River and Champlain Canal system. As a result, dredging, dewatering, material transport, and sediment processing for the Landlocked Area are addressed in a separate Reach 7 FDR (Arcadis, 2014b) and the separate Reach 7 RAWP (Parsons, 2014b) and RAWP addendum (Parsons, 2015b).

However, as also noted previously, the plans in the appendices to this RAWP apply to CU 60 and the Landlocked Area and thus are referenced and incorporated in the separate CU 60 RAWP and the Reach 7 RAWP, with the exceptions and modifications noted therein.

2.1 DREDGING OPERATIONS PROCESS

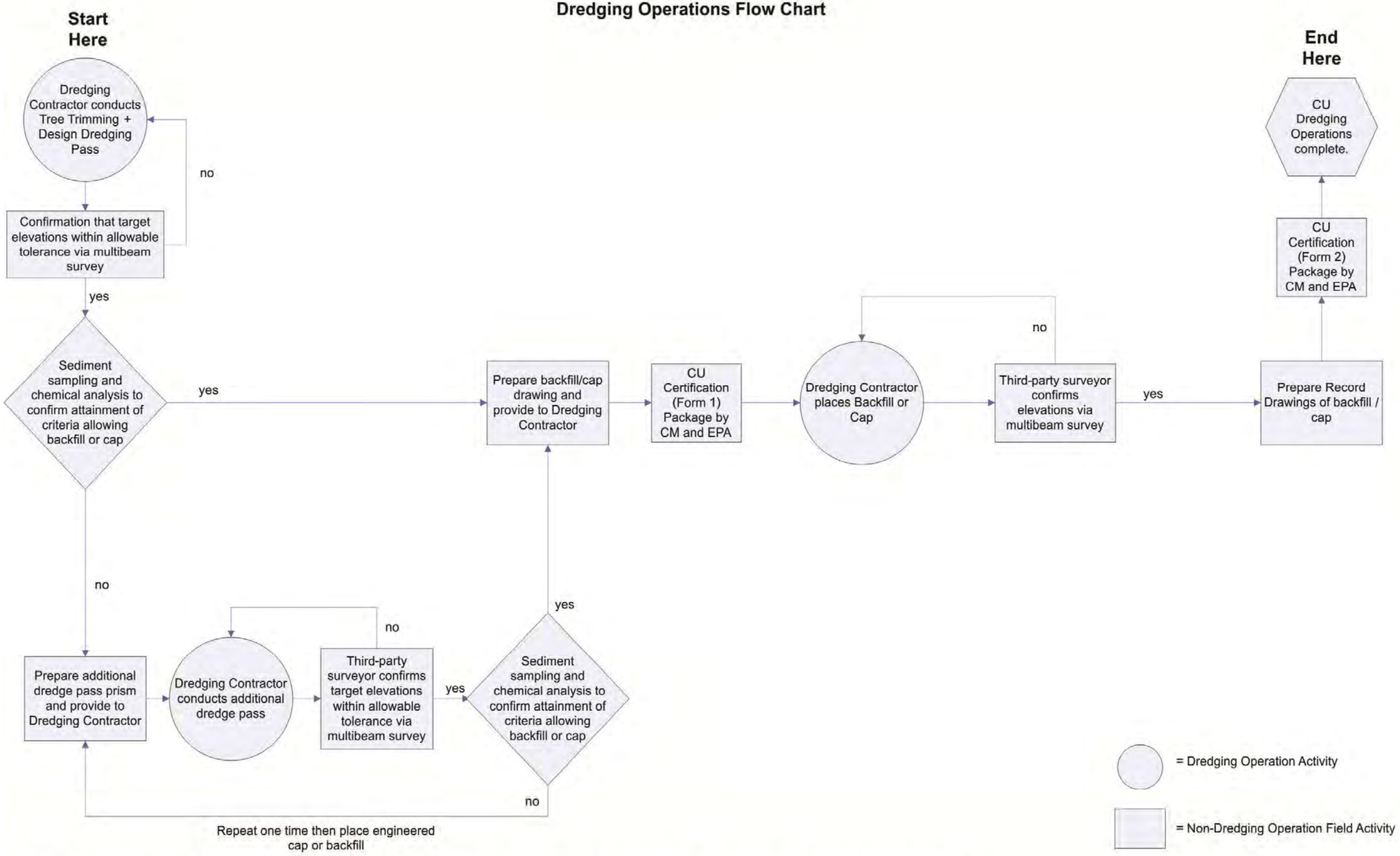
This section provides a brief overview of the dredging operations process. Figure 2-1 provides an illustrative schematic flow chart for the dredging operations sequence and evaluation as further described in the text below. Figure 2-2 shows the specific locations of the four CUs listed above that are covered by this 2015 RAWP.

The initial dredging operations work requires the completion of certain preparation activities before the actual dredging of sediment can begin.

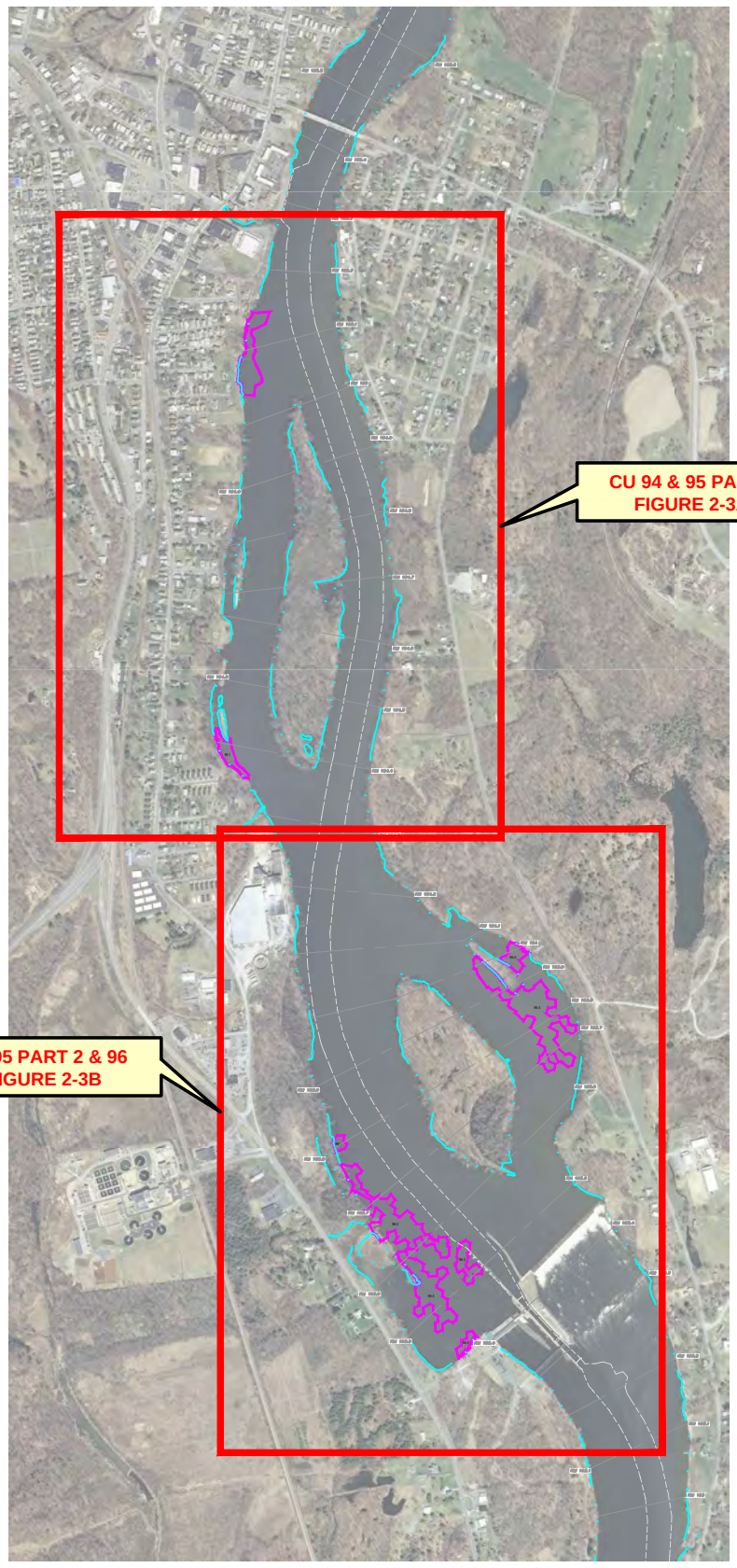
- The dredge positioning control system will be set up and checked to verify that it is working properly.
- Overhanging vegetation will be removed such that dredging equipment is not restricted along the river shoreline.

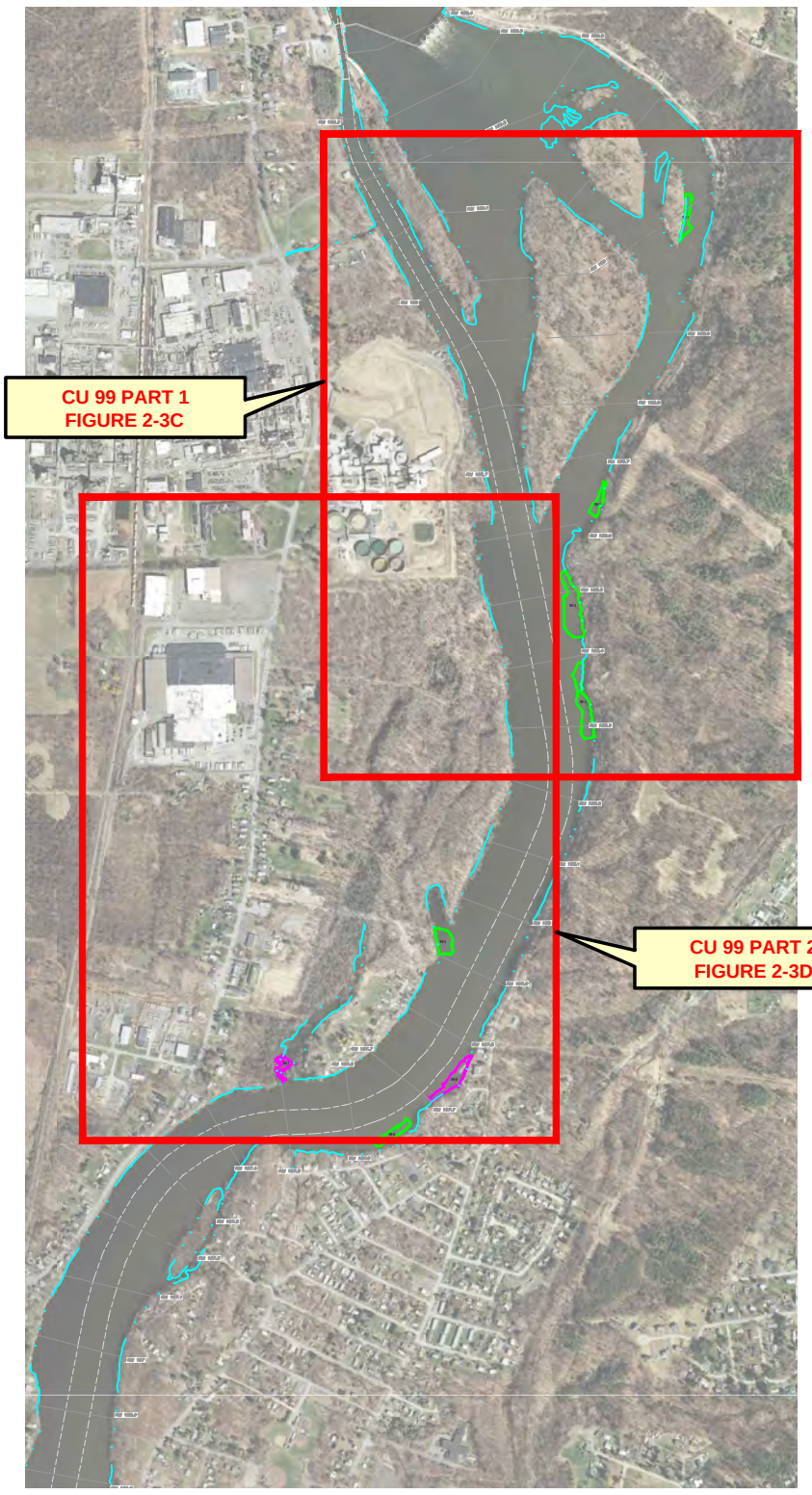
The actual sediment dredging sequence will occur as prescribed in the specifications, moving from upstream to downstream locations in designated CUs, with each CU representing an area of approximately 5 acres, as described in the applicable FDRs. However, dredging in certain downstream areas of the river is anticipated to commence prior to dredging in upstream areas to provide additional time for dredging in areas with lower anticipated productivity, to take advantage of higher river elevations for shallow water areas, to balance the overall project productivity by dredging simultaneously in the CUs farther downstream with the remaining CUs in the northern portions of the river, or to account for other relevant factors. In addition, dredging may be conducted concurrently in multiple reaches of the river separated by a dam or areas separated by more than 1,000 ft to maintain dredging productivity and efficiency. Further, to achieve target productivity rates, dredging will be allowed to occur in a CU that is located immediately downstream of an upstream CU where dredging is being conducted. Any proposed dredging that is not conducted from upstream to downstream in a given area will be subject to EPA review and approval prior to dredging such area.

Figure 2-1
Dredging Operations Flow Chart



Note: This flowchart diagram is intended to be an aid for reader to understand basic process steps and provided for "information only." Actual process will vary based on conditions and subject to requirements of the Residuals Performance Standard. Refer to Section 2 of the 2015 RAWP for more information and Section 4 of the PSCP (Appendix D to 2015 RAWP) for specific requirements.





1500' 0 1500' 3000'

BAR SCALE

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FORT EDWARD, NEW YORK 12828 (518) 746-5311

DRAWING TITLE
REMEDIAL ACTION WORK PLAN
OVERVIEW OF 2015 PLANNED DREDGE AREA
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	CR	FIGURE 2-2	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		

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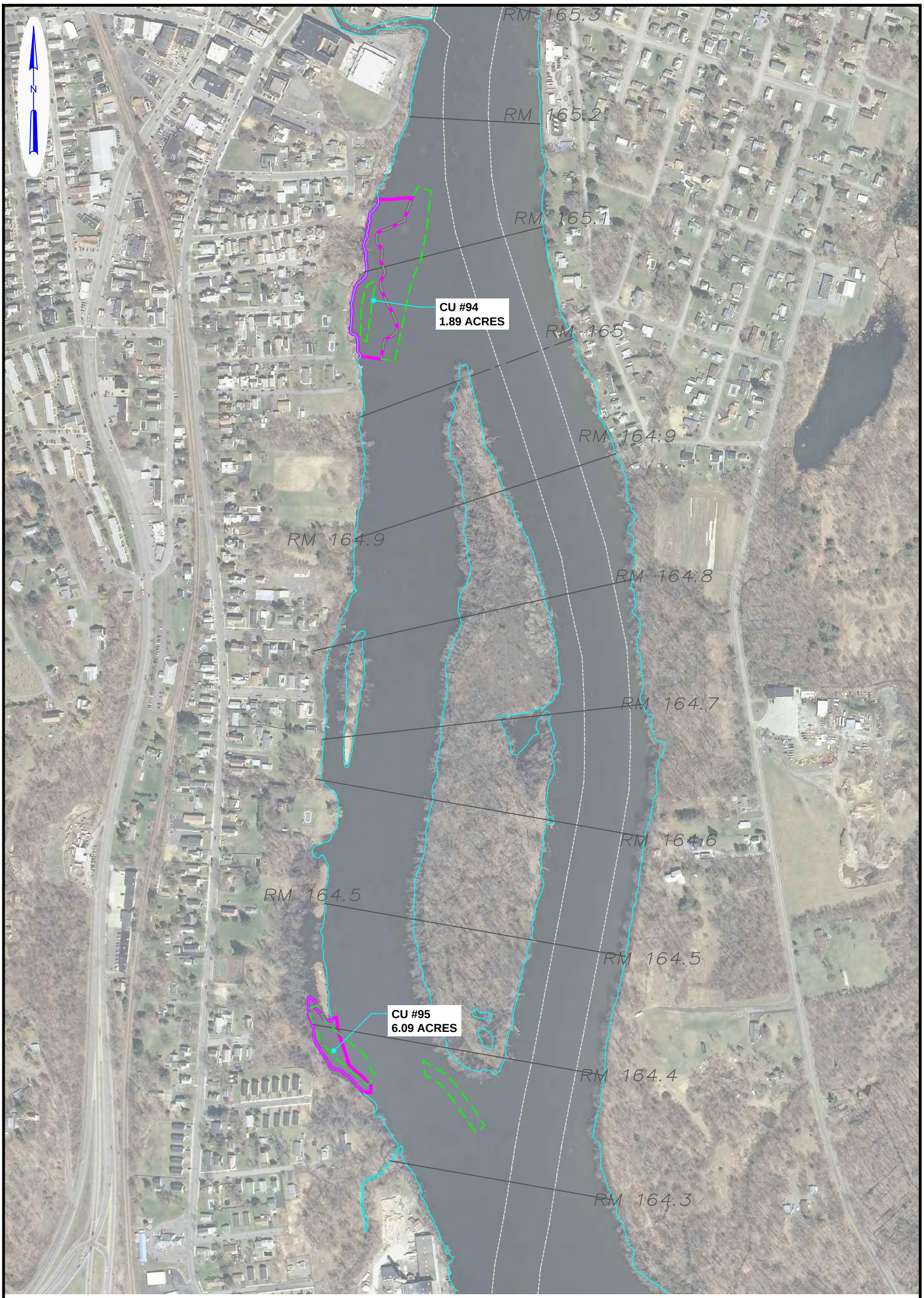

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 47.8')
- NAV CHANNEL
- RIVER MILE MARKER
- PROPOSED ACCESS DREDGING AREAS

400 200 0 400

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MWB	MG
DATE	APPROVED BY
2/3/2015	MG

DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2015 PLANNED DREDGE AREAS
CERTIFICATION UNITS 94 & 95
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-3A	AS SHOWN
	JOB NO.

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP 2-2, 2-3, 2-4.DWG
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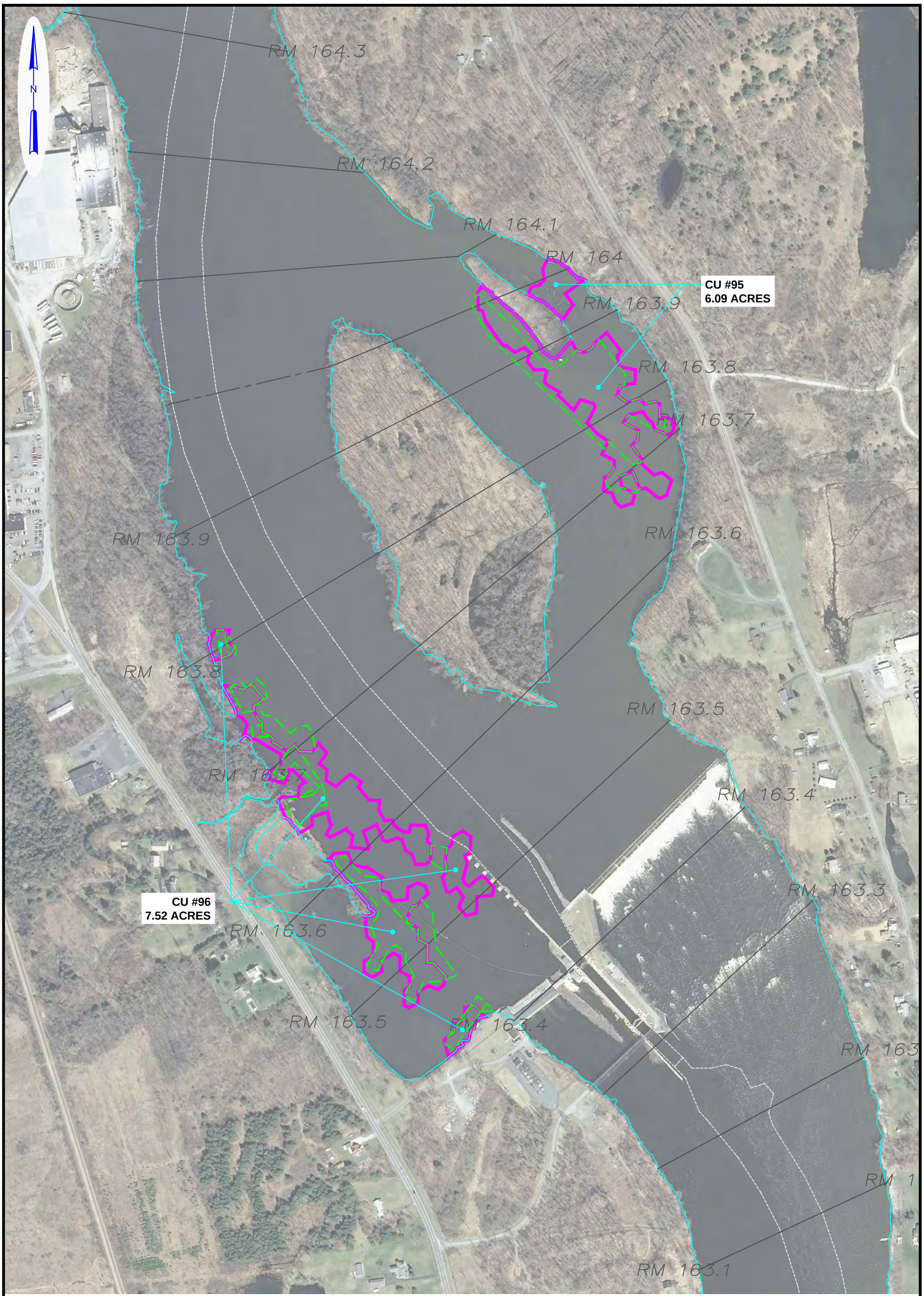

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 47.8')
- NAV CHANNEL
- RIVER MILE MARKER
- PROPOSED ACCESS DREDGING AREAS

400 200 0 400

BAR SCALE

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DATE	APPROVED BY
2/3/2015	MG

DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2015 PLANNED DREDGE AREAS
CERTIFICATION UNITS 95 & 96
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-3B	AS SHOWN
	JOB NO.

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LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 16.0')
- NAV CHANNEL
- RIVER MILE MARKER
- PROPOSED ACCESS DREDGING AREAS
- CU # — DREDGING COMPLETED IN SEGMENT OF CU

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2015 PLANNED DREDGE AREAS
CERTIFICATION UNIT 99
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-3C	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		

FILE NAME: C:\USERS\P003604A\DOCUMENTS\PARSONS 2015\PROJECTS\2015 RAWP\2015_RAWP.DWG
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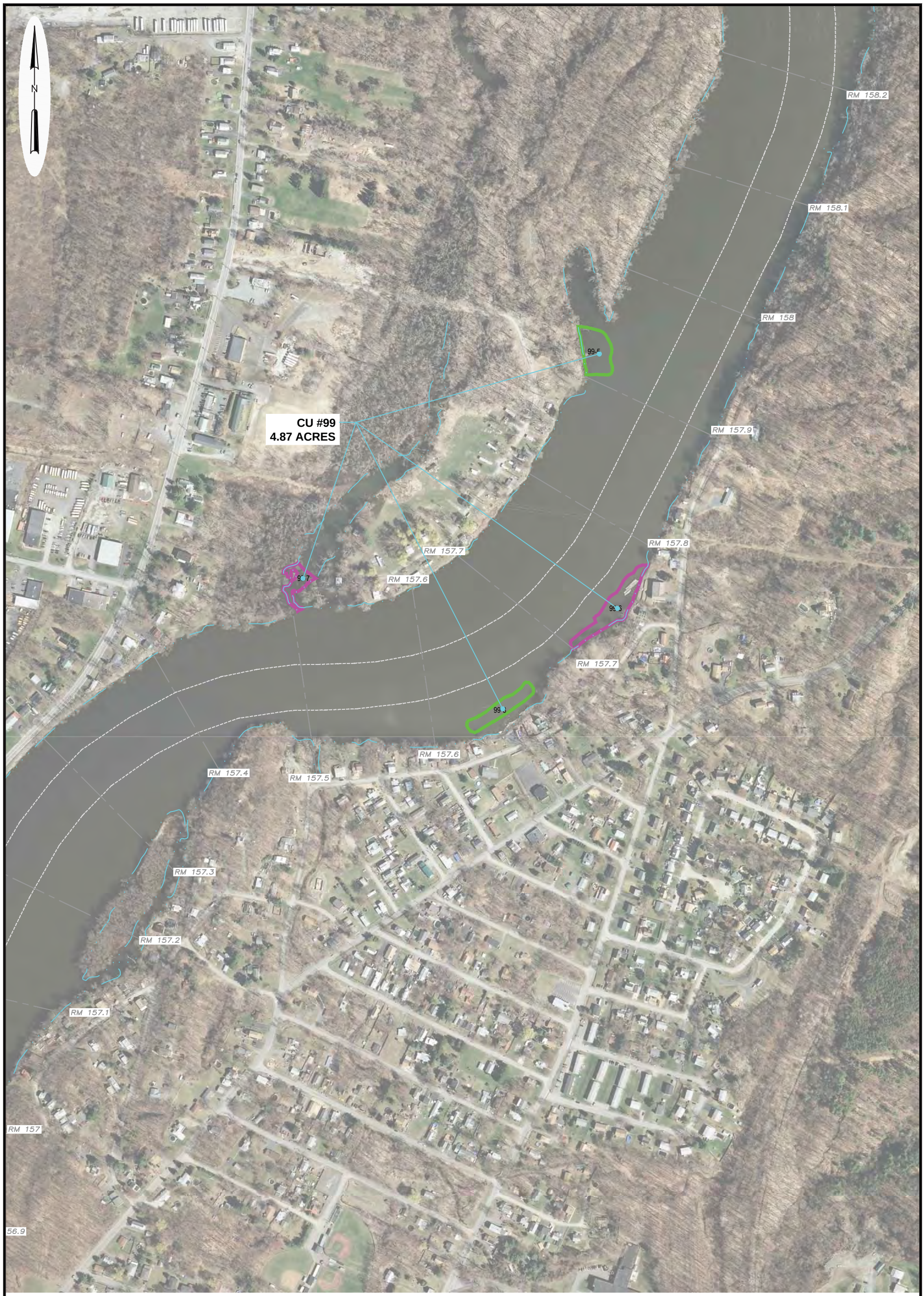


LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 16.0')
- NAV CHANNEL
- RIVER MILE MARKER
- PROPOSED ACCESS DREDGING AREAS
- CU # — DREDGING COMPLETED IN SEGMENT OF CU

400 200 0 400

BAR SCALE

PARSONS ENVIRONMENT & INFRASTRUCTURE GE COMPANY - PARSONS PROJECT OFFICE BUILDING 40-2, 381 BROADWAY FORT EDWARD, NEW YORK 12828 (518) 746-5311	DRAWING TITLE **REMEDIAL ACTION WORK PLAN** **2015 PLANNED DREDGE AREAS** **CERTIFICATION UNIT 99** **HUDSON RIVER PCBs SUPERFUND SITE**
DRAWN BY: MWB; CHECKED BY: MG DATE: 2/3/2015; APPROVED BY: MG	DRAWING NO.: FIGURE 2-3D SCALE: AS SHOWN JOB NO.:

FILE NAME: C:\USERS\P003604A\DOCUMENTS\PARSONS 2015\PROJECTS\2015 RAWP\2015_RAWP.DWG
PLOT DATE: 2/2/2015 6:37 PM PLOTTED BY: BELLACK, MICHAEL

After the Dredging Contractor informs the CM that the dredge prism limits are achieved within the allowable dredge tolerances in a given CU or portion thereof, a third-party hydrographic surveyor will perform a multi-beam survey of that CU or portion to determine if the dredge limits have been achieved within the tolerances described in Section 13803 – Dredging, of the Contract 42A specifications. (The portion of a CU subject to evaluation will vary from CU to CU, but will typically be approximately one-half of a CU and will not be smaller than one acre in size unless otherwise approved by EPA.) If that survey shows that the Dredging Contractor has not met those limits, the CM will direct the Dredging Contractor to conduct further dredging in certain areas of the CU. If that survey shows that those dredge limits have been met, sediment confirmation sampling will occur. In 2012, it was established that the Dredging Contractor's survey data are consistent with the third-party hydrographic surveyor's surveys, and GE used the Dredging Contractor's survey data to confirm that the first pass dredge prism limits have been achieved. This practice was continued in 2013 and 2014 and may continue in 2015 once consistency of the Dredging Contractor's survey data has been verified and with EPA approval.

Assessing the compliance of dredging in shoreline areas using multi-beam measurements may be supplemented with single beam hydrographic survey data or land survey measurements, as described in the 2015 DQAP (Appendix A).

If the results of the sediment confirmation sampling indicate that the criteria specified in the PSCP (Appendix D) for backfilling or capping have been met, a backfill or engineered cap plan (as applicable under the PSCP criteria) will be provided to EPA for review and approval, and the Dredging Contractor will be directed to place backfill or cap materials in accordance with the EPA-approved design. If the results of the sediment confirmation sampling indicate that re-dredging is necessary or appropriate under the PSCP criteria, an additional dredging surface will be generated and the CM will direct the Dredging Contractor to re-dredge the necessary portions of the CU or portion thereof. This process may be repeated for a second and final re-dredge attempt following the PSCP criteria.

Dredging along shorelines at the edges of CUs that extend to the shoreline will be addressed in accordance with the Phase 2 CDE (Attachment A to the revised SOW). For the CUs in River Section 3, the shoreline is defined separately, for the two reaches, as shown in Table 2-1.

Table 2-1 River Section 3 Reaches and Elevations

Reach	CUs	Shoreline Elevation Contour (NAVD88)	Pool
Reach 3	CU 94-96	47.8	Lower Mechanicville Pool
Reach 1	CU 99	16.0	Troy Pool

As provided in the Phase 2 CDE, the maximum cut for initial dredging at a shoreline is 2 ft and the dredge slope cut will be limited to a 3:1 slope away from that cut (until it intersects the

dredge prism based on elevation of contamination) to maintain shoreline stability. These shoreline areas will be sampled and evaluated in accordance with the procedures specified for such areas in the PSCP.

The Dredging Contractor will use best management practices to minimize resuspension of dredged sediment and to minimize the occurrence of visual plumes related to dredging operations.

Throughout the dredging process, sediments will be transported by barge through the intervening Champlain Canal locks to the unloading wharf, where the sediments will be unloaded, dewatered, temporarily staged, loaded into rail cars, and shipped via rail to the approved disposal facilities, as described in the Facility O&M Plan and the 2013 TDP (as discussed above in Section 1.3).

Once dredging is completed within each CU and the CU has been approved to receive backfill and/or cap material, the CM will direct the Dredging Contractor to implement the EPA-approved backfill or cap plan. The type of backfill to be used is predetermined, as depicted in the Contract 42A B-series drawings. The type of cap to be placed will be dependent upon the river velocity and the residual PCB level at that location, as depicted in the Contract 42A C-series drawings.

Dredging Contractor operations will normally be performed 6 days per week, 24 hours per day. If necessary to meet production targets, the Dredging Contractor may work a 7th day after notifying the CM and receiving CM approval. In that event, GE will advise EPA of the intent to work the 7th day before work is performed on the 7th day.

In the season(s) following completion of the 2015 dredging operations, habitat construction work in portions of the areas dredged in 2015 will occur. This work will be described in a work plan for the year in which such habitat construction work will occur.

2.2 MOBILIZATION ACTIVITIES

This section briefly discusses the Dredging Contractor's mobilization activities to occur before the dredging operations can begin.

Mobilization is the process of procuring materials and equipment, transporting equipment, establishing the support facilities necessary to conduct the work, and providing project-specific training for construction and QC crews. A summary of the activities performed during dredging operations mobilization is provided below:

- Procure any necessary equipment in a timely manner so that it is available to mobilize per the schedule detailed in Section 4.
- Set up field offices including project administration and communication systems.
- Confirm communication processes with CM, New York State Canal Corporation (NYSCC), PFOC, and other key parties.
- Establish on-site worker support systems for safety, sanitation, decontamination, etc.

- Set up signage, and other aids to navigation.
- Establish project survey control network and conduct preparatory surveys.
- Transport equipment to site and establish systems for storage, fueling, repairs, and maintenance.
- Establish equipment positioning controls and field test.
- Launch, de-winterize, and/or prepare floating equipment for operations and test operational control systems.
- Bring materials to site for environmental protection, spill response, and sediment sheen response
- Create stockpiles of materials for initial backfill/cap placement.
- Conduct site training for contractor personnel.

The Dredging Contractor intends to begin mobilization of its equipment in advance of the opening of the Champlain Canal by staging such equipment on a property in Schuylerville that GE leased during prior Phase 2 activities for stockpiling and loading backfill and capping materials and general support activities – known as the Saratoga Barge Loading Area (SBLA). The location of this property is shown in Figure 2-4B. During the period before the opening of the Champlain Canal, the Dredging Contractor will use this property to stage, assemble, and place barges, tugs and other equipment into the river for implementation of 2015 dredging.

Table 2-2 provides the list of major equipment that will be available at the project site during the 2015 dredging process. The different types of equipment detailed in Table 2-2 have been selected to meet the target removal volumes for the 2015 D&FO in the main stem of the river and provide sufficient flexibility to dredge in the range of river conditions reasonably expected in the 2015 dredge areas. The amount of equipment that will be in use at any given time will vary.

Table 2-2 List of Major Dredging Equipment

Construction Equipment	Quantity	Construction Activity	Description
Dual-Purpose Dredge or Backfill / Cap Platforms	6	Dredging and / or Backfill / Cap Placement	Barge-mounted Excavator
Regular Hopper Barges	17	Dredging	Hopper Barges for Dredging
Large Hopper Barges	5	Dredging	Large Hopper Barges for Dredging
Shallow Draft Hopper Barges	10	Dredging	Shallow Draft Hopper Barges for Dredging

Table 2-2 List of Major Dredging Equipment (continued)

Construction Equipment	Quantity	Construction Activity	Description
Material Barges	4	Backfill / Cap Placement	Deck Barges for Backfill / Cap Material Transportation
Tugboats	22 (17 small tugs and 5 live aboard tugs)	Dredging and Backfill / Cap	Marine Transportation, Tending of Work Platforms and Tending at Barge Loading and Unloading Wharfs.

As part of the dredging operations mobilization, an inspection by an independent licensed marine surveyor of new-to-the-project marine equipment greater than 25 ft in length and all tugboats regardless of length will be performed to confirm seaworthiness and ability to perform their intended role and function prior to the start of work. Previously inspected marine equipment that has been previously used on the project and has not left the project site will not be included in the inspection by the independent licensed marine surveyor, but will undergo an inspection by the CM and the contractor operating the vessel.

2.3 EQUIPMENT STAGING AND SUPPORT PROPERTIES

The Dredging Contractor's equipment will be staged at the Work Wharf, the equipment lay-down area, and the SBLA and will be spudded or anchored in the Hudson River or Champlain Canal. Both the Work Wharf and equipment lay-down area are located at the sediment processing facility. Crew parking and docks for crews to access crew boats will be provided at the South TIP Crew Change Location, the SBLA, the Rensselaer Barge Loading Area (RBLA), the Lock 1 Crew Change Location, and other sites obtained in 2015 as needed to support the work. The Alcove Marina and Admiral's Marina may be used for habitat construction staging. Crews will use the parking and crew boat access points nearest to their work location. The locations of the different support properties are shown in Figures 2-4A through 2-4D.

2.4 SHORELINE VEGETATION PRUNING

Shoreline vegetation that overhangs the dredge areas will be pruned to allow the safe and effective operation of dredge and shoreline stabilization equipment and minimize incidental damage to trees. In some cases, trees or stumps with diameters at breast height (DBH) of 6 inches or more in the vicinity of or below the shoreline elevation contour (as defined above and depicted in the drawings) will be left in place unless the Dredging Contractor proposes their removal and the CM approves. This pre-dredge pruning will begin with an evaluation and marking program to determine the extent of tree removal and pruning required. This evaluation will be based on a review of all tree trunks or limbs that protrude into the river beyond the shoreline dredge limit. Any designated removal will be reviewed with the CM, who will coordinate with shore-side property owners, as necessary, in accordance with the property access procedures described in the 2015 PAP in Appendix E. Only the vegetation/trees necessary to implement the dredging project will be identified for removal. Prior to the trimming or removal

of any vegetation/trees, GE will submit an inventory of the trees proposed for removal and a plan showing the locations of those trees to EPA for review and approval.

Tree removal and vegetation pruning will be conducted under the oversight of a Certified Arborist. Vegetation removal and pruning will be accomplished using chain saws, pruning shears, and other similar cutting equipment provided by the Dredging Contractor. Work from the waterside will be conducted using floats or barges that can support the necessary equipment and still operate in the shallow water along the shoreline. Some specialized long-reach equipment and man-lifts may be used to cut overhead branches and lower them with the use of a crane to the barge deck positioned below. Work in archeologically sensitive areas will be completed consistent with Contract 42A Specification 01353 (Cultural Resources).

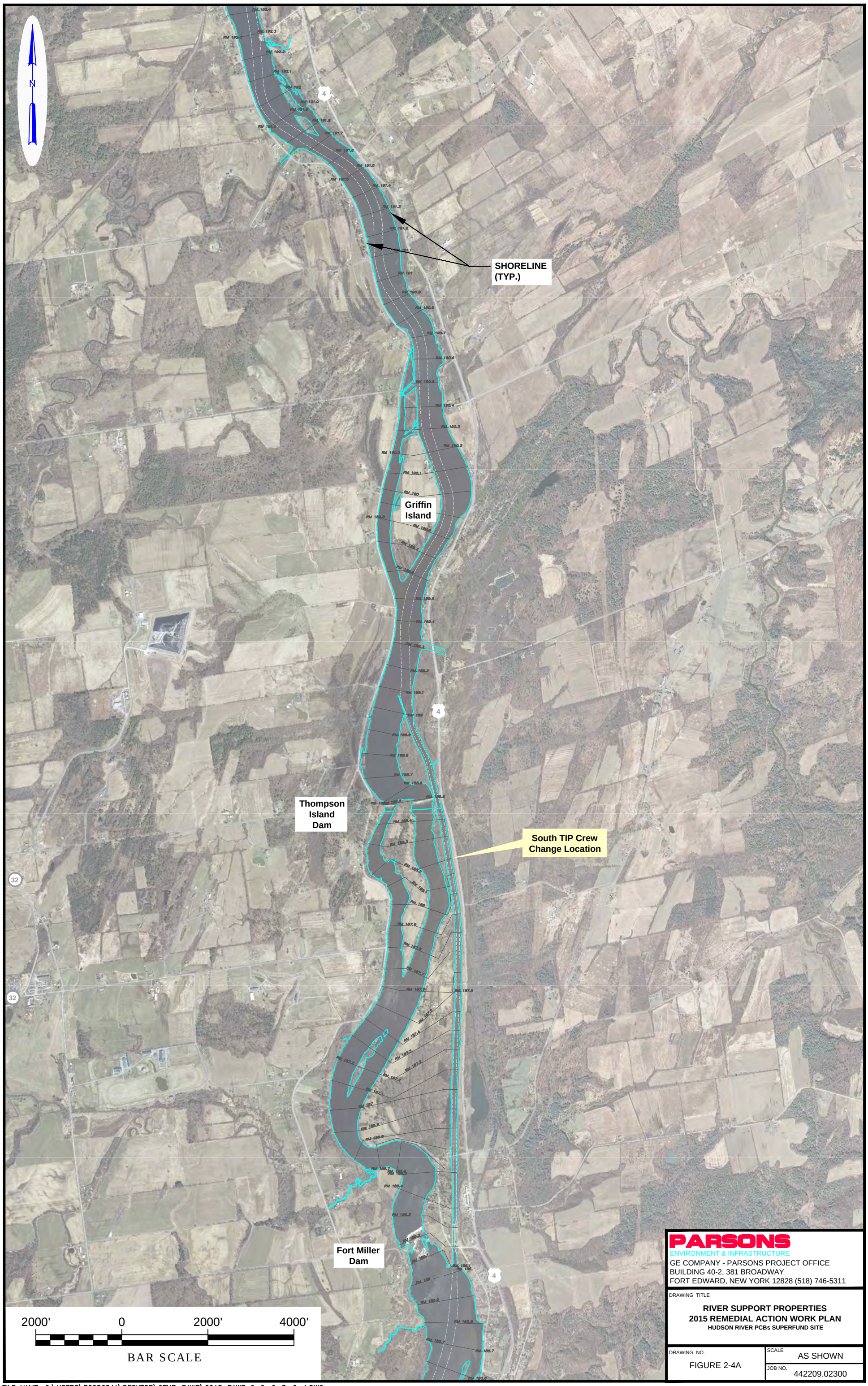
The Dredging Contractor will chip the tree trimming debris on barges and into hoppers located on barges. This operation will comply with the Phase 2 QoLPS. Sound barriers or other engineering controls will be implemented on the tree chipping barges before chipping activities take place. To minimize the number of logs handled, trees with a DBH of up to 12 inches will be chipped. Logs that have a diameter of greater than 12 inches will be cut into 8-foot (ft) lengths. Wood chips and logs will be off-loaded from barges at the General Support Property, the SBLA, the RBLA, or other remote staging areas approved by EPA and trucked to:

1. the Washington County Transfer Station for reuse by the Washington County Department of Public Works;
2. the Easton or Fort Ann Washington County Highway Department facilities for reuse by the Washington County Highway Department; or
3. the Town of Clifton Park Transfer Station for reuse by the general public.

Upon completion of the shoreline vegetation pruning activities, as-built drawings will be prepared and provided to EPA that depict the limits of vegetation removal and tree pruning. This will be done by depicting shaded areas on the plans representing limits over which removal/ pruning was conducted with dimensions based on project controls. Coordinate-based trim locations or removals for individual trees will not be identified.

2.5 SEDIMENT SHEEN RESPONSE AND OTHER WATER QUALITY CONTROLS

During dredging operations, the Dredging Contractor will take measures to minimize the movement of sediment-related sheens, and other water quality controls may also be implemented, as described below.



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DRAWING TITLE

RIVER SUPPORT PROPERTIES
2015 REMEDIAL ACTION WORK PLAN
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-4A	AS SHOWN
	JOB NO. 442209.02300

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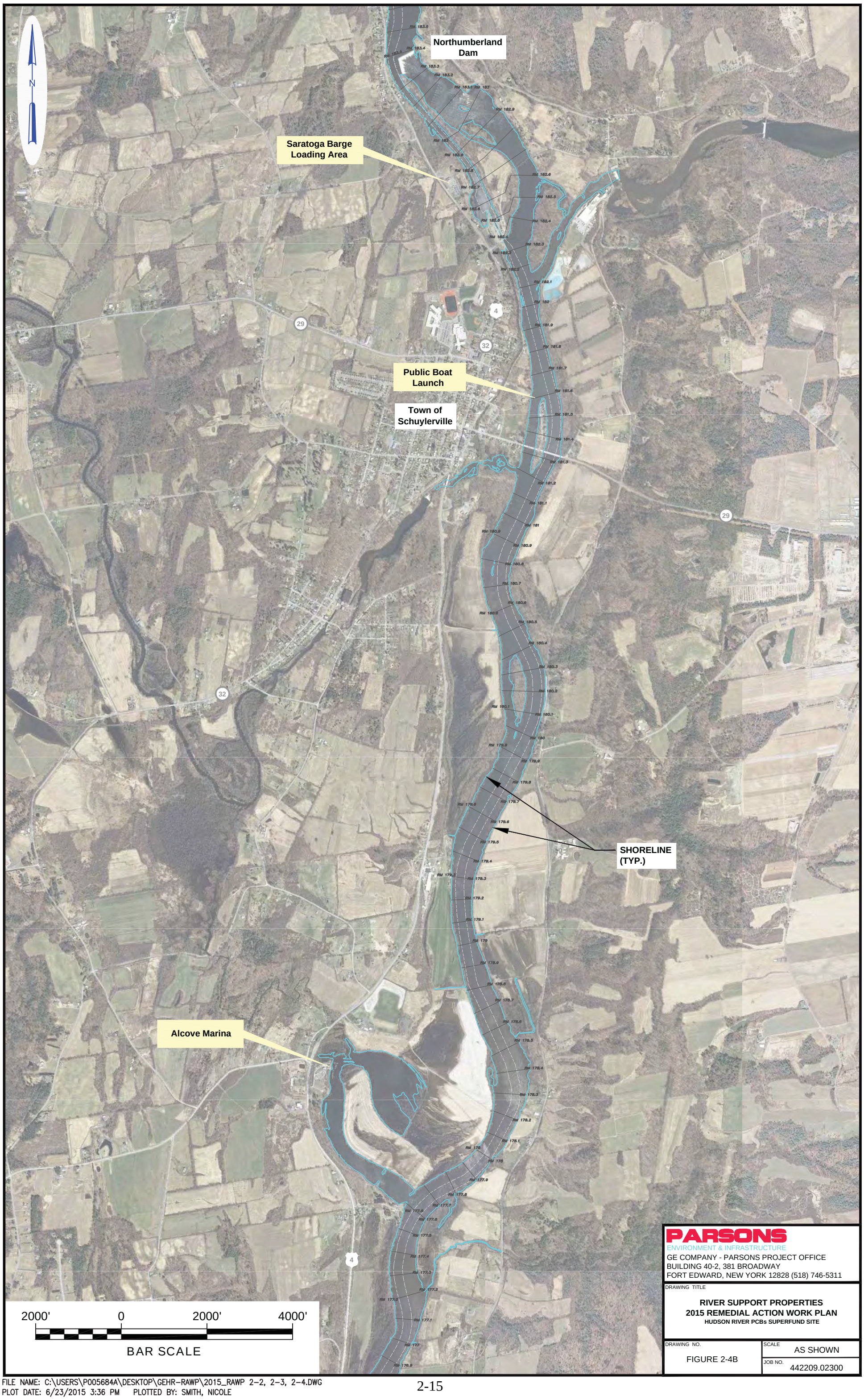

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DRAWING TITLE

RIVER SUPPORT PROPERTIES
2015 REMEDIAL ACTION WORK PLAN
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-4B	AS SHOWN
	JOB NO. 442209.02300

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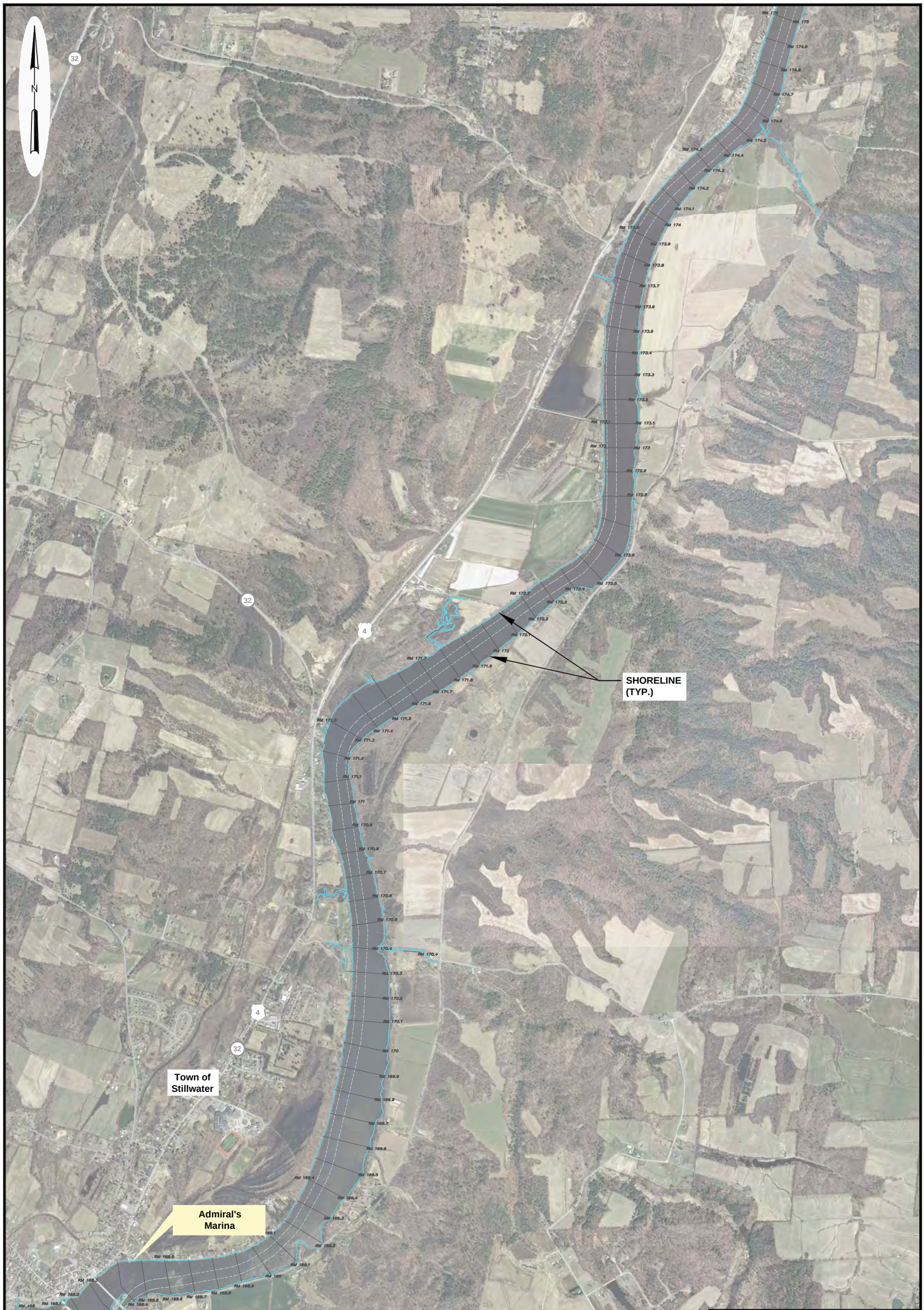

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DRAWING TITLE

RIVER SUPPORT PROPERTIES
2015 REMEDIAL ACTION WORK PLAN
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-4C	AS SHOWN
	JOB NO. 442209.02300

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City of Mechanicville

Rensselaer Barge Loading Facility

Quack Island

Lower Mechanicville Dam

SHORELINE (TYP.)

Lock 1 Crew Change Location

Town of Waterford

2000' 0 2000' 4000'

BAR SCALE

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DRAWING TITLE

RIVER SUPPORT PROPERTIES
2015 REMEDIAL ACTION WORK PLAN
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-4D	AS SHOWN
	JOB NO. 442209.02300

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2.5.1 Sediment Sheen Response

When dredging operations commence in an area identified as a Sediment Oil Sheen Response BMP area on the Contract Drawings, and in other areas when directed by the CM, the Dredging Contractor will deploy a control boom and oil-absorbent materials (e.g., MyCelx Versimat) downstream of that dredging activity. Once deployed, the Dredging Contractor will verify that the booms and absorbent materials are properly deployed to maximize their potential to control the sediment oil sheens. In addition, if sediment oil sheens are observed to have collected behind control booms or other stationary locations within the work areas, the Dredging Contractor will actively collect the sheens and other floating debris in contact with the sheens. Sheen collection will be performed in the same manner as was done in 2013 and 2014. If no sheens have been observed after 48 hours of conducting dredging activities in that location, the Dredging Contractor may request authorization from the CM to remove the booms and absorbent materials. In considering such a request, the CM will also evaluate the surrounding nodes and project experience in similar areas. The booms and absorbent materials will be removed only after receiving approval from the CM. If, after removing booms and absorbent materials, sediment sheens are later observed in that area the Dredging Contractor will immediately re-deploy the booms and absorbent materials and respond in accordance with Specification 13871.

2.5.2 Other Water Quality Controls

Other water quality controls may be implemented, if necessary, to control atypical situations during in-water operations (e.g., an accidental discharge). Such controls may include devices such as oil-absorbing booms to control accidental oil leaks from marine equipment or floating booms to contain floating debris such as wood waste. The Dredging Contractor will plan for the potential need for additional water quality controls and will provide sufficient equipment to be able to respond quickly to water quality issues that may potentially occur based upon observation of an event or as directed by the CM based upon results of the monitoring operations.

2.6 CONVENTIONAL DREDGING OPERATIONS

All dredging in CU 94, sub-unit CU 95-1, CU 96, and CU 99 will be done within the designated CU as described in Section 2.1 above and the Contract 42A technical specifications, except as may be approved by EPA based on local river conditions. (The specific dredging approach and procedures for sub-units CU 95-2 and CU 95-3 are described separately in Section 2.13 below.) Dredging is the removal of the specified prism of contaminated sediment in each CU as shown on the Contract 42A D-series drawings. Up to one design dredging prism and two additional dredge prisms may be provided to the Dredging Contractor for each CU or portions of a CU. Additional dredge prisms will be issued if post-dredging sampling indicates that sediment remains requiring re-dredging as described in the PSCP. Plans for conducting each of these dredging operations are further detailed in this section.

During the course of dredging, the Dredging Contractor may identify specific portions of dredge areas, not previously identified in the design, where dredging would present unsafe work

conditions (e.g., due to obstructions) or where the sediment or substrate conditions would make dredging very inefficient and/or cause undue delay to the schedule (e.g., locations with a very thin sediment layer and/or substrate consisting of rocks and cobbles). Consistent with the approach described in Step 4 in Section 2.4.3 of the Phase 2 CDE, GE may propose to exclude dredging in those specific areas, if any are encountered. In such a case, GE will inform EPA of its proposal to exclude the location from dredging and present its rationale for that exclusion. Any such proposed exclusion of dredge areas will be subject to EPA approval.

Such potentially unsafe areas may include those near fixed structures in or adjacent to dredge areas that have the potential to be weakened if their foundations or the armor stone protecting their foundations were to be dredged. In the interest of safety and minimizing risk of damage to these structures, the Dredging Contractor will determine a proposed revised dredge limit to establish an appropriate setback from the structure. The revised dredge limit will be subject to EPA review and approval. To minimize removal of armor stone protecting the foundations of these structures, a field survey will be undertaken at each structure to locate the armor stone. Generally, the Dredging Contractor will probe the 10-ft offset perimeter before dredging the locations. If armor stone is located at the setback perimeter, the Dredging Contractor will continue probing to find the interface of the mud line and the rip-rap, then re-establish the dredge perimeter 10 ft into the river from that interface point, and dig on a 2:1 slope to the removal limit. The field survey methods may vary on a case-by-case basis depending on the field conditions, but the goal of minimizing risk of damage to the foundations of the structure or removing armor stone protecting the foundations will remain the same. River structure field surveys and associated photographs will be provided to EPA.

If, through the course of the dredging work, the Dredging Contractor removes armor stone while digging around a structure or if the final dredge elevations are such that additional armor stone is determined by the CM to be appropriate, the Dredging Contractor may place additional armor stone at that location. If this occurs, EPA will be notified and provided information regarding how the situation was addressed.

2.6.1 Dredging

Dredging will be accomplished mechanically utilizing hydraulically operated excavators equipped with enclosed 5 cubic yard (cy) and 2 cy clamshell buckets. The dredge bucket will be fully enclosed such that, when closed, it will minimize loss of sediment from the bucket when raised from the river bottom until opened in the sediment barge hopper. All dredges will be equipped with a bucket positioning system to allow the dredge operator to accurately control the dredge operations horizontally and vertically. Dredged material will be placed in barges for transport by tugs through Locks 1 through 6 (as applicable) and then Lock 7 of the Champlain Canal to the sediment processing facility.

Debris encountered during dredging will be removed by the dredge equipment at the same time as the sediment is removed. If the dredge is unable to remove the debris using the dredge

bucket, up to two additional attempts will be made with an excavator or crane equipped with one of the following attachments:

- Open bucket with opposable thumb;
- Conventional excavator bucket; or
- Hydraulically operated bucket.

Debris will be placed into the hopper barges and transported to the sediment processing facility to be off-loaded. Larger debris, to the extent practicable, will be loaded into one side of the hopper barge to facilitate off-loading at the sediment processing facility.

No dredging, mooring, or anchoring of vessels will be allowed in identified cultural resource areas marked in the drawings as "off limits." Workers will also be instructed regarding the potential for encountering previously unknown potentially significant archeological resources, as described in Specification 01353, during dredging. As described in that specification, any potentially significant archeological resources that are encountered will not be further disturbed until the CM is notified and the determination is made whether a professional evaluation is required. The CM or GE will notify EPA if potential archaeological resources are encountered or recovered during dredging activities. Care will also be taken to avoid disturbance to wetlands beyond the dredging limits.

The dredge platforms will utilize spuds to secure the platforms in the river. A spud is essentially a steel column, similar to a pile, which is secured to the barge and is moved up and down by utilizing a winch. The spud, through gravity, will secure the dredge platform in place. When the dredge platform is to be moved, either of the following forms of movement may be employed: (1) raising the spuds off the river bottom, moving with the assistance of a tug, and then lowering the spuds; or (2) moving by "crabbing" – a technique whereby the first spud is lifted and the barge is rotated about the second spud, then the first spud is lowered, then the second spud is lifted and the barge is rotated about the first spud, then the second spud is lowered (and repeated as necessary). Sediment barges will not be equipped with self-mooring equipment (i.e., spuds or ground tackle), but will be secured with mooring lines to dredge platforms, backfill/capping platforms, docks, or dolphins or will be moored in the fixed mooring field(s). Sediment barges will be moved with the assistance of tugboats.

Depending on river conditions, the Dredging Contractor may identify additional areas to be dredged outside of the sequence discussed in Section 2.1. The CUs targeted for dredging in 2015 are not contiguous and are broken into several small discrete areas separated from one another. In order to conduct work efficiently, dredging in several such areas will be performed simultaneously with CM and EPA approval, as discussed in Section 2.1.

To accomplish dredging in shallow areas, the Dredging Contractor will utilize specialized dredging equipment and operating procedures. Although regular hopper barges will be used in shallow areas to the maximum extent possible, shallow draft hopper barges, similar to those used during the 2011 through 2014 dredging activities, will be utilized in some very shallow areas.

These barges will be designed to have shallow operating drafts and will be loaded only to the extent they will not come into contact with the river bottom during loading or transit in accordance with the specifications. These shallow draft hopper barge units will be fitted with coaming walls to receive and retain dredged material during transport.

Depending on river flows, access dredging will need to be conducted in very shallow areas to provide sufficient water depth for dredges and hopper barges to access the area. The access dredge areas for 2015 are shown on Figures 2-3A through 2-3D. These areas will be dredged following the dredging protocols and requirements set forth in this plan and the sediment will be transported by barge to the Fort Edward processing facility similar to sediments within CU boundaries.

Due to the shallow pre-dredge and design prism depths within CU 96, additional access dredging, along with removal of the remains of submerged timber and stone cribs in the vicinity of and likely associated with the historic Mechanicville Hydroelectric Plant, will be necessary to access and complete dredging operations in that CU. The access dredging for CU 96 will be performed in four separate narrow areas along the western limit of the dredge area, as shown in Figure 2-3B; and the dredged material will be loaded into a mini-hopper barge for transport to a transload dredge that will load the material into a large hopper barge for transport to the processing facility. The cribs will be removed prior to dredging operations to gain access to the dredge area and allow safe loading of hopper scows. Using a conventional digging bucket, the dredge will push over or side cast the cribbing material to remove that material from the dredge areas. Prior to removal of the cribs, archaeologists will review and inspect the cribs and document them with field sketches and photographs in accordance with the *Archaeological Monitoring Measures for Certification Units 96 and 99* (URS, 2015a). A report covering this archaeological monitoring and documentation will be submitted to EPA.

Long-reach excavators will be used to reach into shallow or restricted width areas. The long-reach excavators will be fitted with 2 cy level-cut enclosed clamshell buckets and will be able to load regular hopper barges as well as shallow draft hopper barges. To reach into restricted-width areas, a specially designed long-reach excavator will be available and able to rotate with a loaded bucket 180 degrees to load shallow draft barges attached to the stern of the dredge.

To minimize the potential for generated residuals when dredging very shallow shoreline areas, the Dredging Contractor will begin by dredging sufficient material to provide sufficient depth to allow the dredging equipment to move into the shallow area and reach the top of the slope. During this initial cut, the Dredging Contractor will not dredge to below the dredge prism unless required to provide sufficient water depth. Once sufficient water depth is available, the Dredging Contractor will remove sediment to below the dredge prism from the top of slope to the bottom of slope. This method will minimize the potential for any sloughed sediment to remain in the dredge area and force an additional dredge pass. The Dredging Contractor will

coordinate with the CM when working in shallow areas, particularly when activities are planned during higher flows.

When used, shallow draft hopper barges will be brought alongside a nearby dredge unit operating in deeper water that is loading a regular-sized hopper barge and the sediment from the shallow draft hopper barge will be trans-loaded by that dredge into the regular-sized hopper barge for transport to the processing facility.

During full production dredging, each CU will be completed and surveyed by GE's third-party independent hydrographic surveyor prior to confirmation sediment sampling. If hydrographic surveys indicate that required dredge tolerances have not been met, dredging will continue until the hydrographic surveys show that the required elevations have been achieved within the allowable tolerances. As described in Section 2.1, if it can be established that the Dredging Contractor's survey data are consistent with the third-party hydrographic surveyor's surveys, then GE may use the Dredging Contractor's survey data to confirm that the dredge prism limits have been achieved after the first pass. Residual sediment sampling will then be conducted and sampling results will be analyzed to determine whether backfill or engineered caps may be placed or re-dredging is required under the PSCP criteria.

An exception to performing dredging to the required elevation limits is when bucket refusal (e.g., bedrock) or clay (Glacial Lake Albany Clay) areas are encountered. In either of these cases, the Dredging Contractor will notify the CM so that the CM can confirm the presence of clay or bucket refusal and provide approval for the revised elevation limits of dredging. Additionally, the CM will notify EPA if the Dredging Contractor encounters clay or bucket refusal before reaching the required elevation limit. Post-dredging survey and sampling will still be done in clay and bucket refusal areas of each CU to determine if backfill or a cap needs to be placed in those areas. If the Dredging Contractor does not encounter clay in the clay areas identified in the Contract 42A drawings but has reached the dredge prism elevation limit that was based on an assumed clay layer, the Dredging Contractor will inform the CM and will continue digging until reaching the Depth of Contamination (DoC) elevation that had been calculated using the core PCB data.

2.6.2 Positioning Control

The Dredging Contractor will use one of the following two approaches for determining and controlling the position of the dredge bucket, depending on conditions at the dredging location:

1. Story Pole;
2. Rotary Sensor

Each positioning approach utilizes Hypack's DredgePack software or a comparable software platform for integration, calculation, and graphical display of sensor and positioning data. Each can use either a real time kinematic (RTK) Global Positioning System (GPS) or Laser Robotic Tracking for positioning. Laser Robotic Tracking utilizes a machine-controlled robotic tracking sensor (gun) located on a shore-based survey control point. The robotic tracking gun

continuously tracks a 360-degree prism mounted on the dredge and wirelessly transmits the calculated position or range and bearing to the dredge guidance computer. Laser Robotic Tracking may be used where physical obstructions prevent the use of the satellite based GPS.

The Story Pole approach uses a pole mounted directly to the bucket. An RTK GPS antenna or 360-degree prism for laser robotic tracking is mounted on top of the pole. Orientation of the bucket is provided via a digital rotation sensor (digital compass or similar). Tilt and roll of the bucket is corrected using two inclinometers mounted at a right angle to each other on the story pole. A limit switch installed on the bucket indicates when the bucket has been closed. Sensor information is transmitted to the guidance computer mounted in the excavator cab. If Laser Robotic Tracking is utilized for positioning, a wireless link will be established between the base "gun" and the positioning system. A differential global positioning system (DGPS) utilizing moving base station RTK technology (CSI Crescent V100 or similar) will provide the position and heading of the dredge platform. DredgePack or similar software receives sensor information and displays the location of the barge and the three-dimensional location of the bucket. This information is displayed on-screen in the operator cab in plan and profile views.

The Rotary Sensor approach utilizes a dual-antenna system mounted directly to the excavator. The antenna provides RTK horizontal and vertical position, as well as heading. A series of rotary sensors collects rotation (angle) information from each of the separate components of the excavator (car body, boom, stick, and bucket). The angles are used in calculations performed by DredgePac or similar software in conjunction with lengths of each of the excavator appendages (boom, stick and bucket) to calculate the position of the bucket. Another rotary sensor mounted on the bucket determines the relative rotation of the bucket with respect to the stick. Tilt and roll of the bucket is corrected by two inclinometers mounted at a right angle to each other on the bucket. A limit switch is installed on the bucket to indicate when the bucket has been closed. Sensor information is transmitted to the guidance computer mounted in the excavator cab. A DGPS system utilizing moving base station RTK technology (CSI Vector or similar) will provide the position and heading of the dredge platform. DredgePac or similar receives sensor information and displays the location of the barge and the three-dimensional location of the bucket. This information is displayed in the operator cabin in plan and profile views. Each setup will provide the xyz coordinates for each bucket location, providing a grid size that is proportional to the bucket dimensions. Additionally, a software driver used within the system records the necessary sensor information, including coordinates at a predetermined frequency, and stores the information in a file.

2.6.3 Non-Native Plant Control and Removal

The presence of non-native aquatic vegetation has been identified in CUs 95 and 96. Concurrent with (or, if necessary, prior to) the dredging, the non-native aquatic vegetation will be removed from the CU and/or access dredge areas containing non-native aquatic vegetation.

Removal of the non-native aquatic vegetation will be accomplished primarily through the actual dredging operation. In certain cases when non-native aquatic vegetation is present and

cannot be removed through the actual dredging operation, a vegetation harvester may need to be used. In either case, a seine net with 1-inch mesh size will be installed in a horseshoe shape downstream of the area being dredged or harvested. A containment boom will be installed downstream of the seine net in a similar configuration. In CU 96, due to the proximity to the hydroelectric plant, it may not be possible to safely install and maintain a seine net along with a containment boom.

The seine net and containment boom will be inspected and maintained daily to remove any floating plant matter or floating debris that has collected against the net or boom. The face of the seine net will be inspected on a weekly basis to identify plant matter and debris trapped on the net. The plant matter and debris will be collected during maintenance activities, placed in bags or containers, and then placed in hopper barges for offloading and disposal at the processing facility. If the weekly inspection identifies plant matter or debris that cannot be efficiently removed and that negatively affects the intended function of the net, the net will be removed and replaced. If the net needs to be removed for any reason, the net will be carefully handled to contain material trapped in the net to prevent loss of such material downstream while the net is being placed in hopper barges for offloading and disposal at the processing facility. The seine net and containment boom will be maintained and moved as needed to allow marine equipment including barges to enter and exit the dredge areas. Harvesting will be stopped when maintenance is performed on the seine net, other than when removing floating vegetation from in front of or debris from the face of the net without altering the net's position.

Where dredging is used to remove the non-native aquatic vegetation, the vegetation will be excavated by the dredge bucket and placed into either a shallow draft hopper barge or a regular hopper scow. Any shallow draft hopper barge will be unloaded into a regular hopper scow. Any plant fragments found on the decks of hopper barges or shallow draft hopper barges will be carefully collected and placed into the hopper of the regular hopper scows for offloading and disposal at the processing facility.

If a vegetation harvester is utilized, the vegetation harvester has a cutting head that can be raised or lowered to cut vegetation at an optimal elevation. The operator will adjust the elevation of the cutting head to minimize sediment disturbance but maximize vegetation removal. Cut vegetation will be transported to the rear of the harvester using conveyor belts and stored in a hopper on the harvester until sufficient plant matter has been gathered in the hopper. Once sufficient plant matter has been gathered in the hopper, the harvester will be moved to a flexi-float barge outfitted with a portable conveyor. When alongside and in position, the conveyor belts on the harvester will be run in reverse to transport the plant matter from the hopper enclosure onto the portable conveyor, which in turn will load the material into a shallow draft hopper barge. The shallow draft hopper barge will then be transported by tug to a nearby dredge and regular hopper scow for transloading. Once the shallow draft hopper barge is immediately alongside the regular hopper scow, the plant matter will be loaded into the regular hopper scow by the dredge to be transported to the processing facility, where it will be offloaded by the

Processing Facility Operations Contractor for disposal. All movement of plant material will be conducted carefully to minimize plant fragments from re-entering the water body. The transfer of plant material from the shallow draft hopper barge to the regular hopper scow will be done with the shallow draft hopper barge placed directly against the regular hopper scow and above the seine net to provide capture of any incidental loss of plant material in the net. At the processing facility, the plant material will be unloaded at the existing unloading positions that include spill plates to catch material that may drop from the bucket during unloading.

In areas where the non-native aquatic vegetation surrounds a dredge area, the Dredging Contractor will propose specific access ways into and out of the dredge area. The presence of non-native aquatic vegetation in the access ways will be monitored by the Dredging Contractor and the CM, and if it is determined that access into the dredge areas cannot be effectively conducted without disturbing the non-native aquatic vegetation, then the vegetation in the access ways will be removed.

2.7 DREDGED MATERIAL BARGE TRANSPORT

Barges used to transport sediments will be certified as fit for duty, clearly marked for identification purposes, and also marked to record draft depth in the water (draft markings). These draft markings may also be used to determine the wet weight of sediment and water in each barge load. Each barge will only be loaded to the capacity that will ensure safe transport from the dredge location to the offload location and prevent potential loss of sediment by overflowing of the barge hopper. Barge dimensions will vary, with a maximum of 42 ft in width in order to fit within Locks 1 through 7 of the Champlain Canal.

Before dredging in a given area, an empty sediment barge will be positioned adjacent to the dredge. In very shallow or confined areas, a shallow draft hopper barge with a capacity of approximately 100 cy may be used. In other areas, standard-sized hopper barges with nominal maximum capacities of approximately 750 cy will be used. The time it takes to fill the barge will be dependent upon the individual dredge's production rate and other conditions. Tugs will be utilized to transport each empty and loaded hopper barge between the dredge area and the processing facility. Prior to transporting the hopper barge to the sediment processing facility, the Dredging Contractor will inspect the barge to make sure that the exterior of the barge is free from sediment, in order to minimize the potential for losing sediment into the water during transport. To the extent possible, sediment found on the exterior of a sediment barge will be placed in the barge hopper, and if necessary, the barge will then be washed down at the dredge site to avoid contamination of non-dredge areas.

During dredging operations in 2015, the barges containing dredged sediments will proceed upriver through Locks 1 to 6 depending on the river reach of the CU being dredged, and then on through Lock 7 to reach the sediment processing facility. Lock operators will be notified regarding the number of barges and anticipated timing of barge transport. After passage through Lock 7, the sediment-filled barges will be moored at the unloading wharfs for unloading.

2.8 ANCHORING

This section describes the anchoring methods for vessels utilized for 2015 dredging operations under various project circumstances and conditions. Anchoring is addressed by Contract 42A Specification 13820 and the relevant drawings in the applicable FDR (e.g., Drawings 4714 through 4747 of the CUs 85-96 FDR). Anchoring requirements will vary during normal dredging operations, during non-work hours (e.g., Sundays), and during storm or high river flow conditions. Anchoring restrictions will be implemented in (a) areas that contain archaeologically sensitive sites, (b) certain areas in the vicinity of active eagle nests as provided in Attachment 3 (see Section 2.14 below), (c) previously delineated SAV or RFW areas outside of CU boundaries, (d) backfilled areas designated as SAV planting, contingency, or natural recolonization areas or designated for RFW construction, (e) areas where caps have been installed, (f) areas outside of CUs where non-native plants have been delineated, (g) NYSDEC-designated wetland areas, (h) locations of utility crossings, and (i) the navigation channel unless approved by EPA in consultation with the NYSCC. Anchored vessels and moorings will be appropriately lit at all times. Safety of downstream facilities will be considered when finalizing anchoring locations.

2.8.1 Anchoring During Normal Dredging Operations

Work support platforms (e.g., platforms for dredging, and backfill/cap placement) will generally be held in position by spuds when dredging, backfilling or other on-water work is being performed. The spuds can then be raised or lowered utilizing a winch. To anchor the platform to the river bottom, the spuds will be lowered and, through gravity, will secure the dredge platform in place. When the platform is to be moved, the movement techniques described in Section 2.6.1 may be used. Sediment and other material barges will not be equipped with self-mooring equipment (i.e., spuds or ground tackle), but will be secured with mooring lines to spudded work platforms, docks, dolphins, the unloading wharf or other fixed moorings.

When support vessels and other small craft are not in transit, they will be secured to spudded work platforms or secured to slips at the support properties. All support vessels will be equipped with appropriately sized ground tackle for use in emergencies.

2.8.2 Anchoring During Non-Working Periods

When not in active work mode (e.g., Sundays), spudded work platforms will be spudded down at or near their work location and outside of the navigation channel to the extent practicable.

Sediment and other material barges not equipped with spuds will be secured with mooring lines to spudded work platforms, the unloading wharf, docks, dolphins, or other fixed moorings.

Support vessels and other small craft will be secured to spudded work platforms or secured to slips at the support properties.

Air monitoring in accordance with the Phase 2 RAM QAPP will continue during periods when uncovered barges containing sediment are staged at mooring posts or other locations.

2.8.3 Anchoring During Storm or High River Flow Conditions

During storm or high river flow conditions, the Dredging Contractor will determine if spudded work platforms, sediment and other material barges, and support vessels have to be moved to lower velocity portions of the river (e.g., closer to shore, into the land-cut portion of the Champlain Canal, below Crocker's Reef Gate in the Champlain Canal) or can remain in the anchoring locations described above.

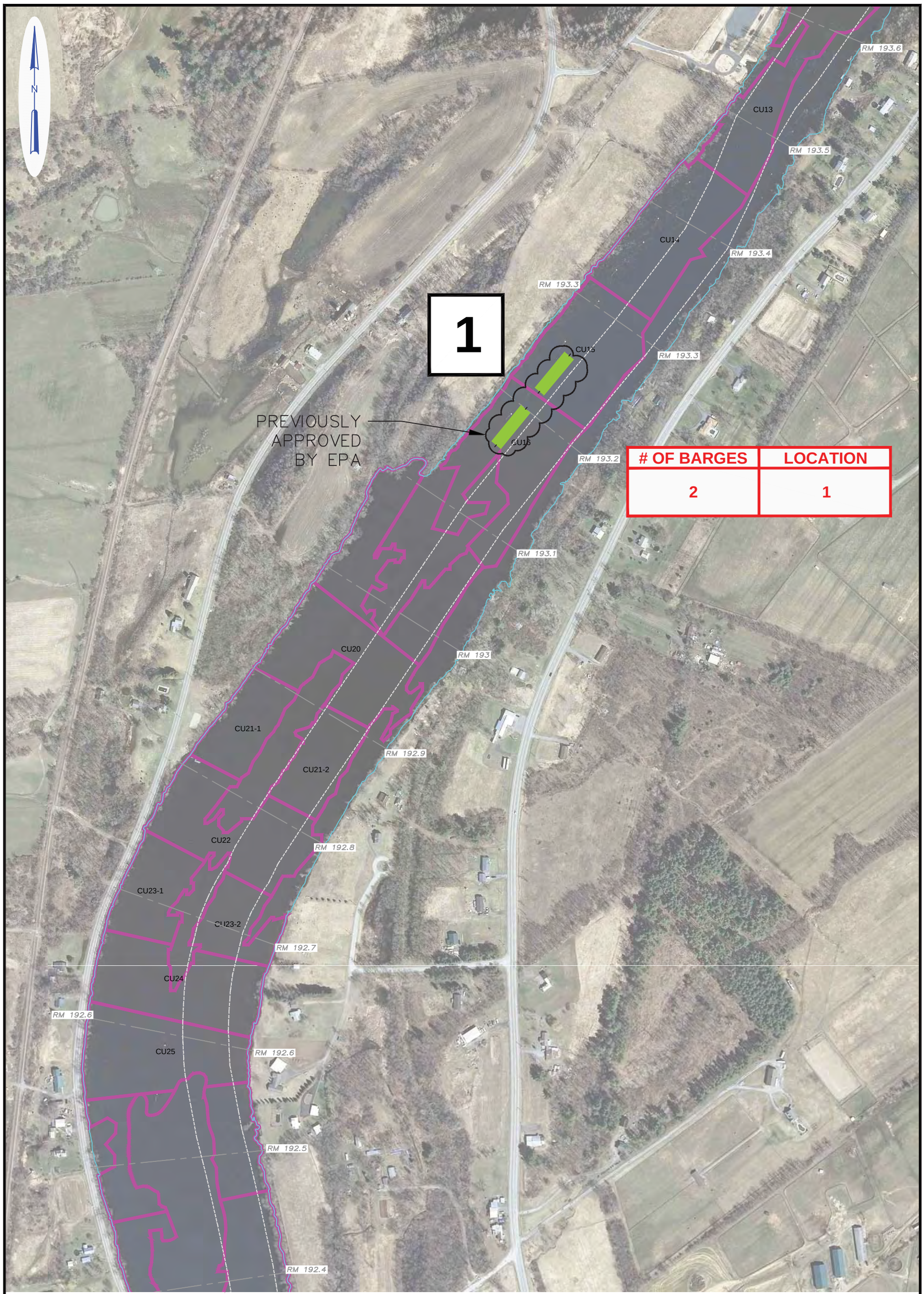
Tug boats operated by the Dredging Contractor will be available during storm or high river flow events to respond to situations as they arise. The decision to operate tugboats during high flows and/or storms will be at the discretion of tugboat captains, who have responsibility for safe operation of tugs.

2.8.4 Additional Mooring Locations

During the course of the dredging operations, it is expected that sediment barges and other material barges will need to be moored as they wait to be used at work platforms or the processing facility. To facilitate this, additional mooring locations will be established at various locations near locks, active dredge areas, support properties and other necessary locations to moor barges and other marine equipment. The additional mooring locations proposed for the remaining dredge areas in the navigable portions of the Upper Hudson River are depicted in Figures 2-5A through 2-5S.

Each mooring position will consist of a bow and stern mooring buoy attached to separate anchors. This arrangement will allow each end of the barge or other marine equipment to be secured and allows it to float parallel to the channel. Mooring positions will be located such that the outside edge of moored equipment is 50 ft outside of the navigation channel unless otherwise approved by the NYSCC. Barges or other marine equipment that are secured to mooring buoys will be equipped with lighting in compliance with USCG and NYSCC regulations. The moorings will exclude any areas with submerged aquatic vegetation that are outside of areas to be dredged.

As dredging work progresses into an existing mooring location, the mooring anchors will be moved to a location downstream of the work or to a previously used mooring location if work in that location has been completed, no caps have been placed in the anchor locations, and no habitat backfill has been placed in the footprint of that mooring location. If additional mooring locations not already approved by EPA are proposed by the Dredging Contractor, GE will provide the proposed locations to EPA for review and approval.



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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 1
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5A	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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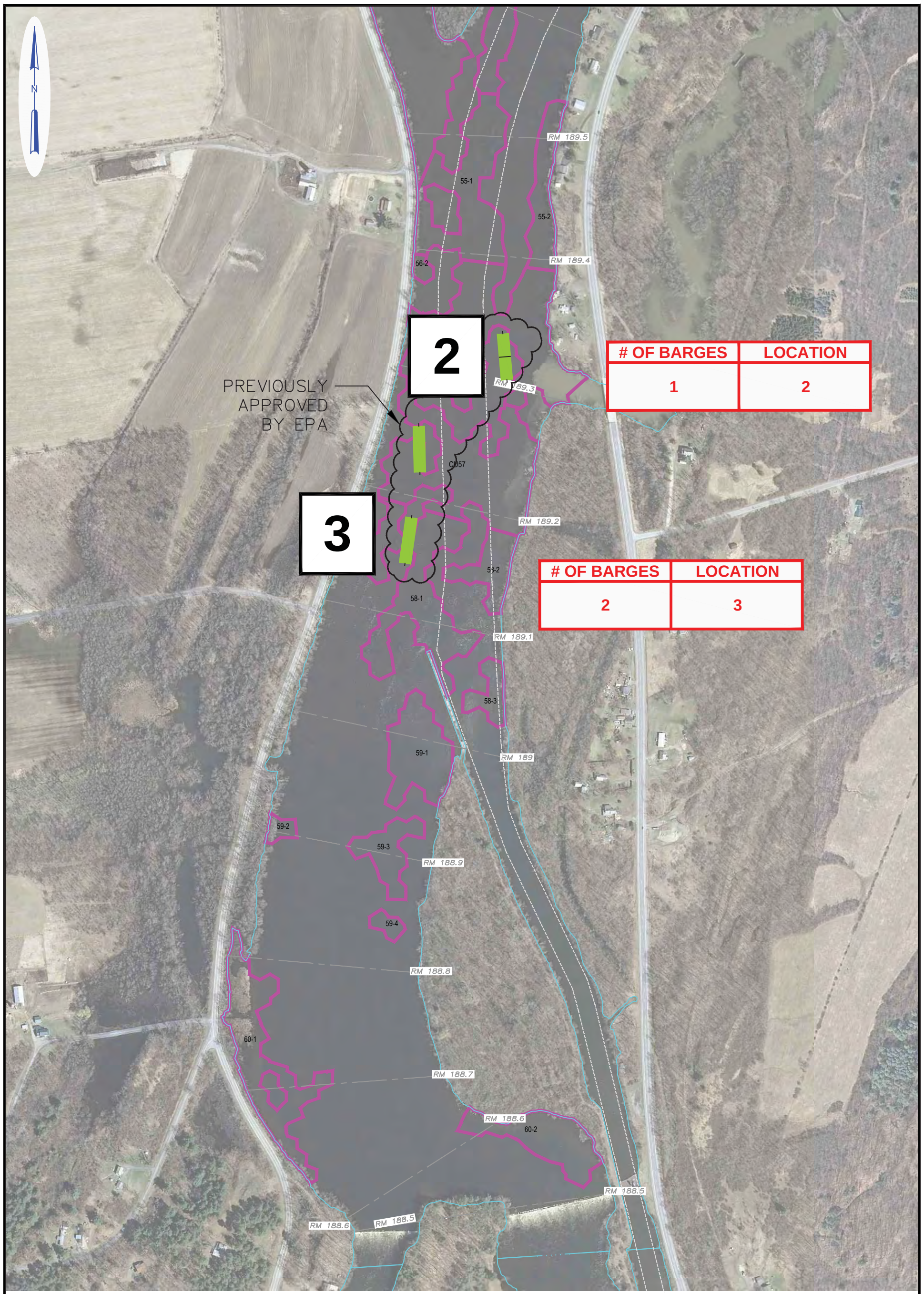

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 119')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATIONS 2 - 4
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5B	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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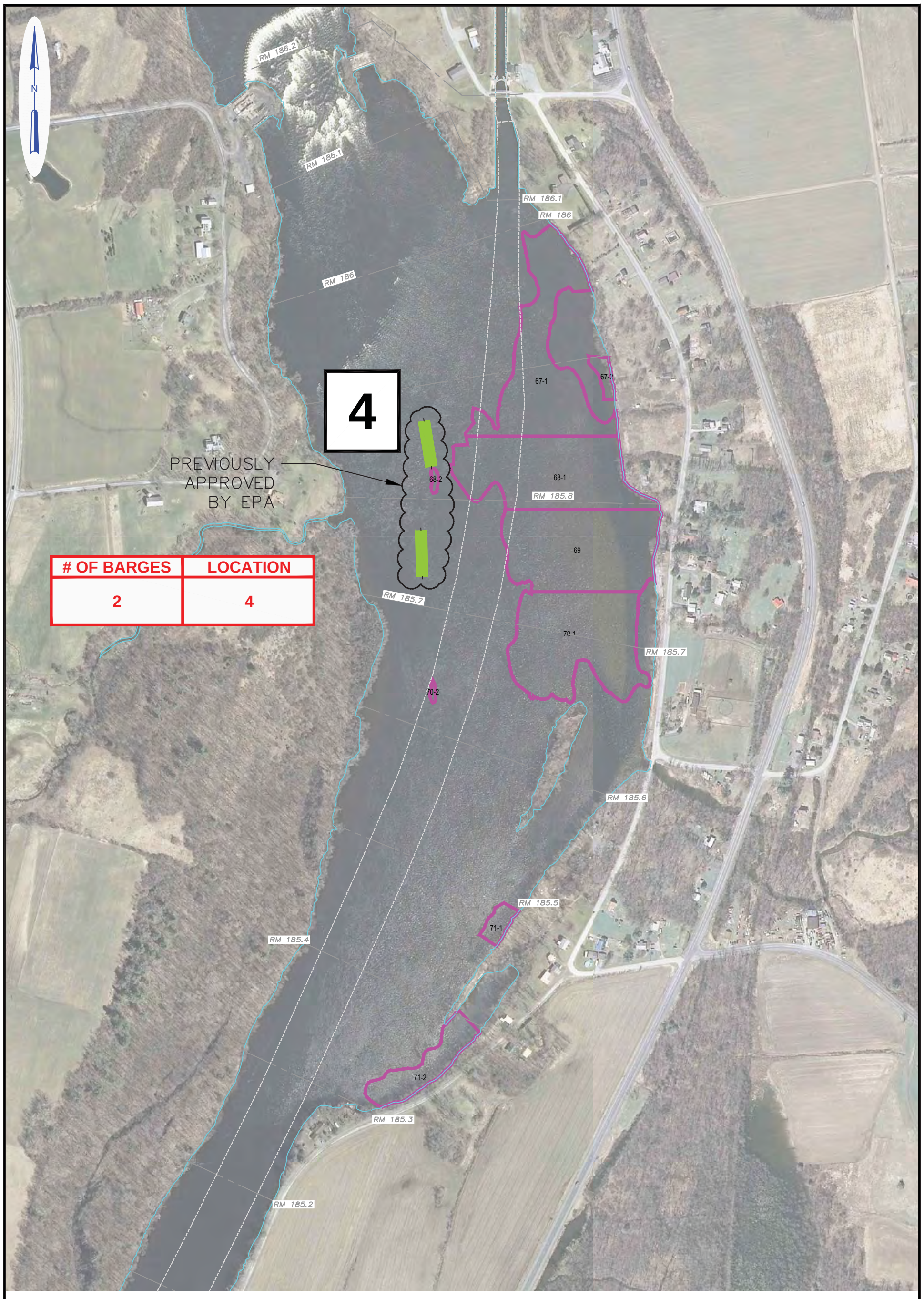

# OF BARGES	LOCATION
2	4

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 102.1')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 5
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5C	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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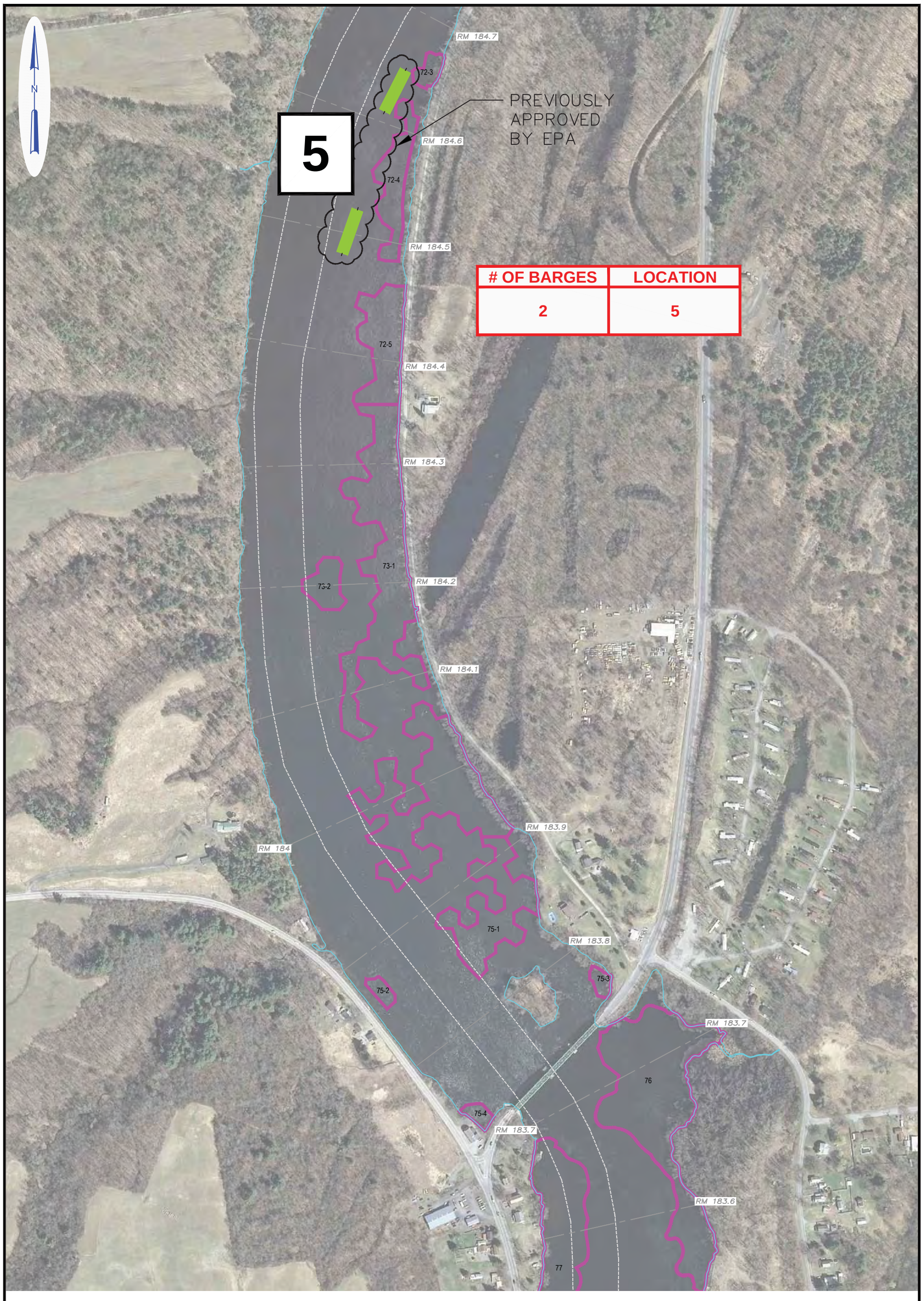

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 102.1')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATIONS 6
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5D	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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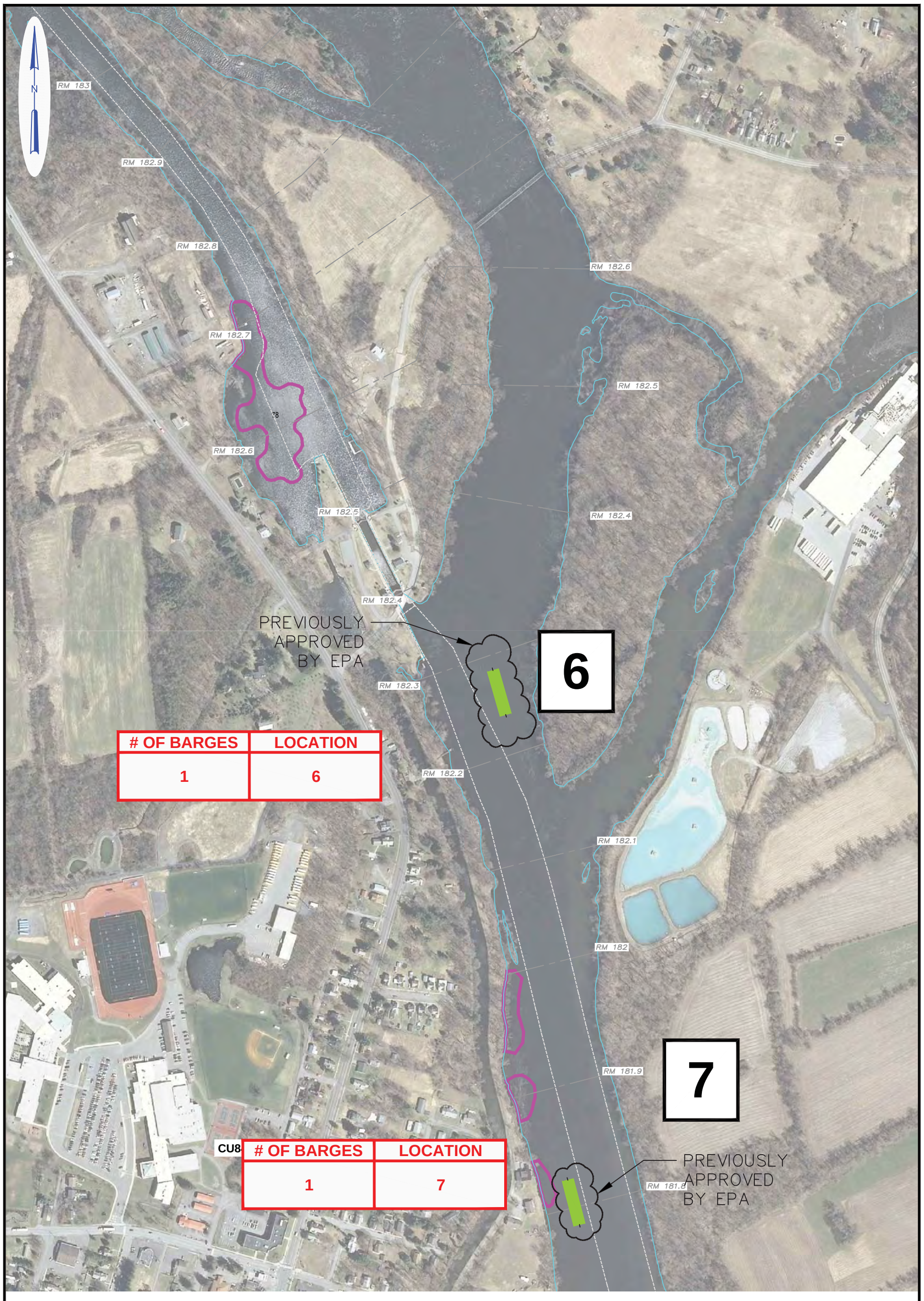

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 84.1')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 7
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5E	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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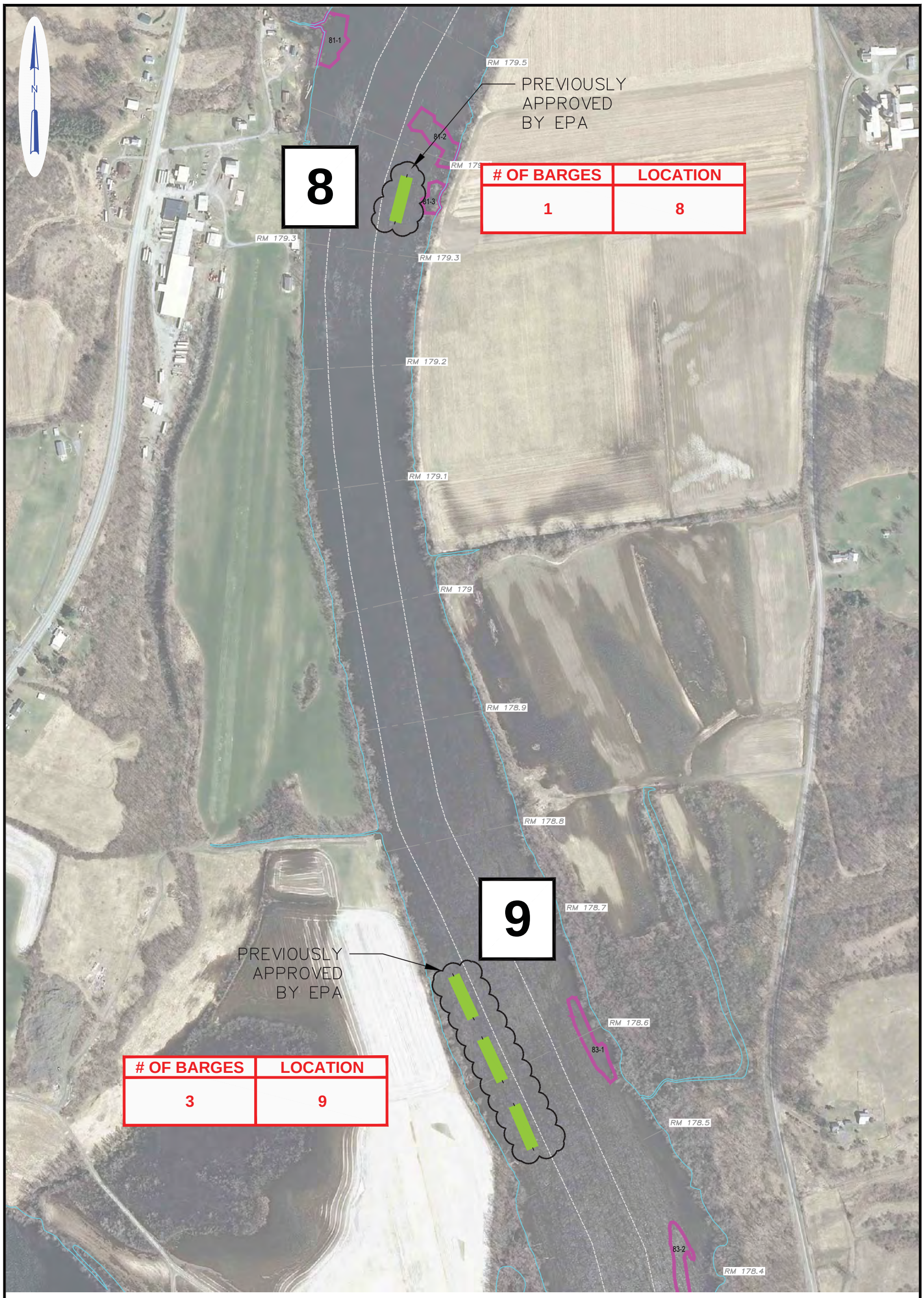

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATIONS 8 - 9
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5F	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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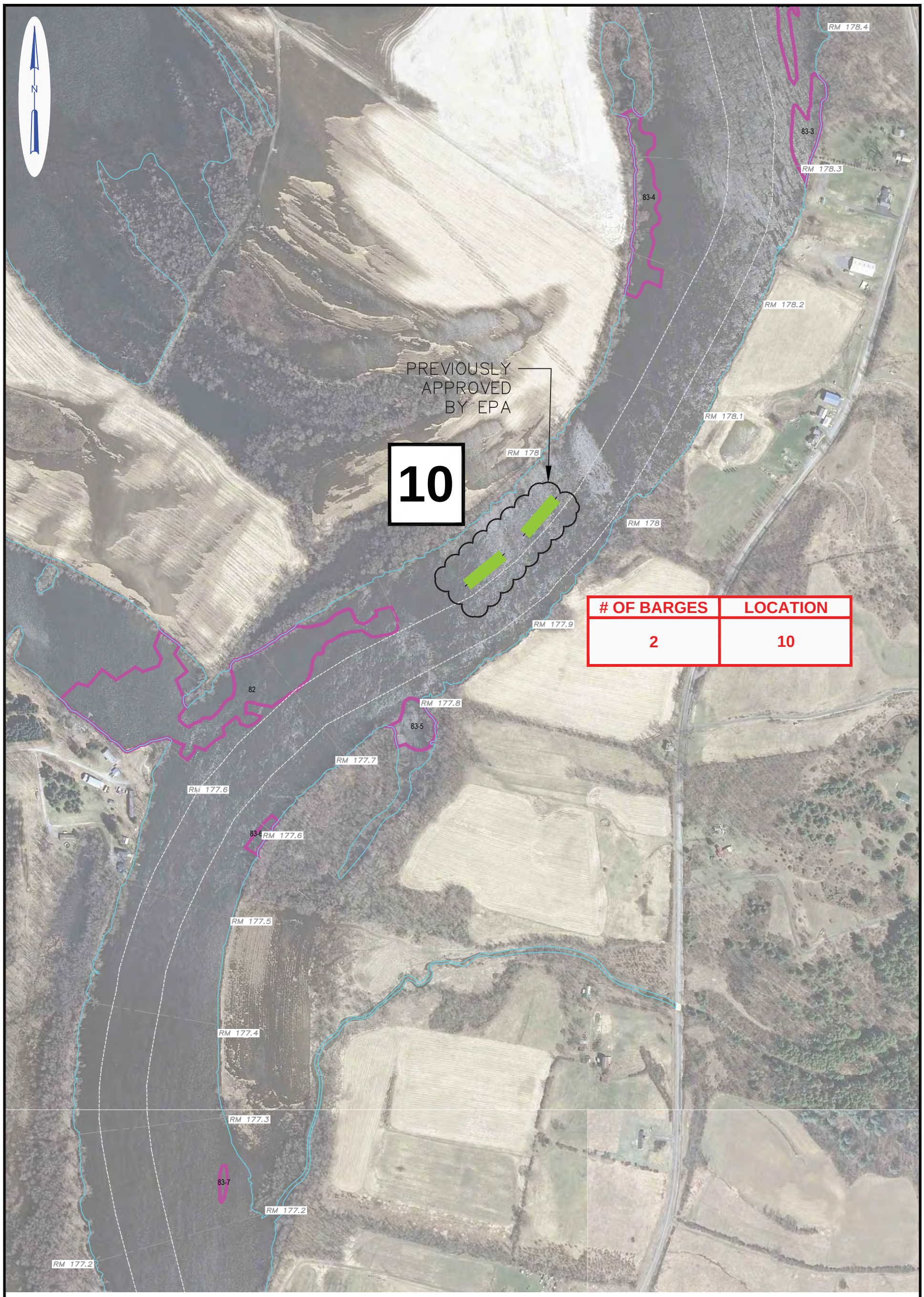

# OF BARGES	LOCATION
2	10

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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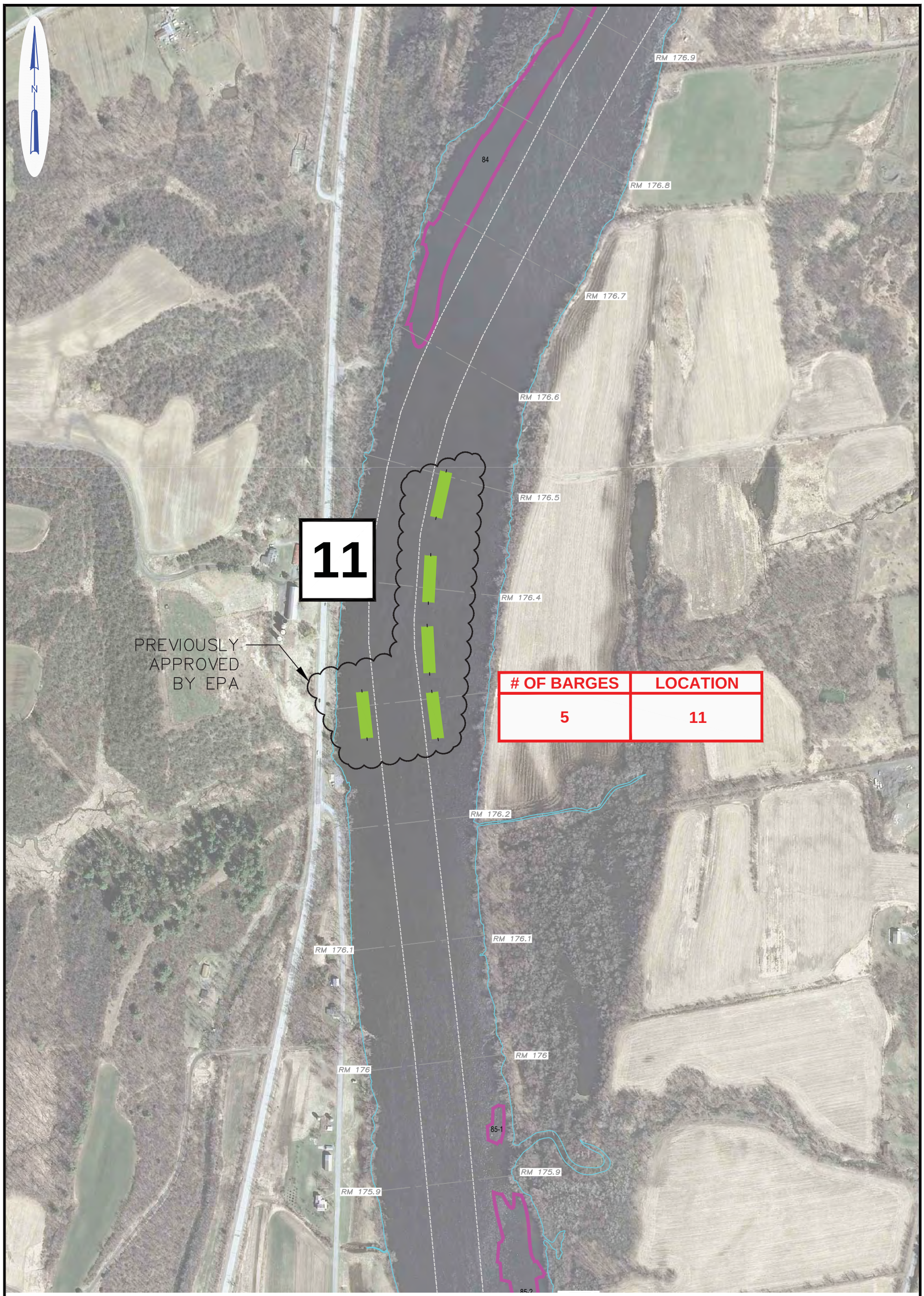
DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 10
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5G	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
PLOT DATE: 4/29/2015 3:12 PM PLOTTED BY: SMITH, NICOLE



LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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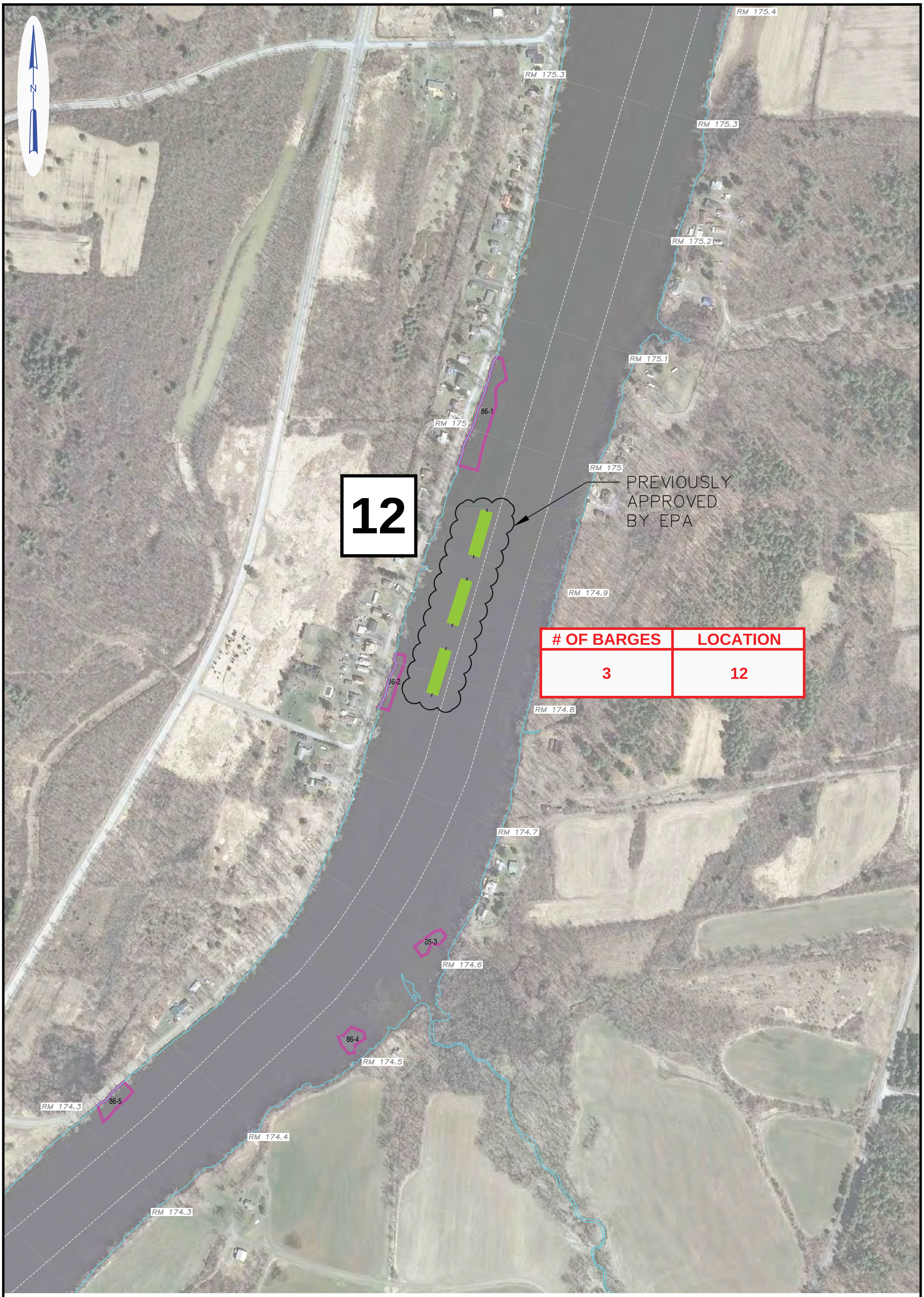
DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 11
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5H	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
PLOT DATE: 4/29/2015 3:12 PM PLOTTED BY: SMITH, NICOLE



# OF BARGES	LOCATION
3	12

LEGEND

CU # — CU BORDER
SHORELINE (ELEVATION 83.6')
NAV CHANNEL
RM 192.1 — RIVER MILE MARKER
BARGE & BARGE MOORING POST

400 200 0 400
BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 12
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5I	AS SHOWN
DATE 2/3/2015	APPROVED BY MG		JOB NO. 442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
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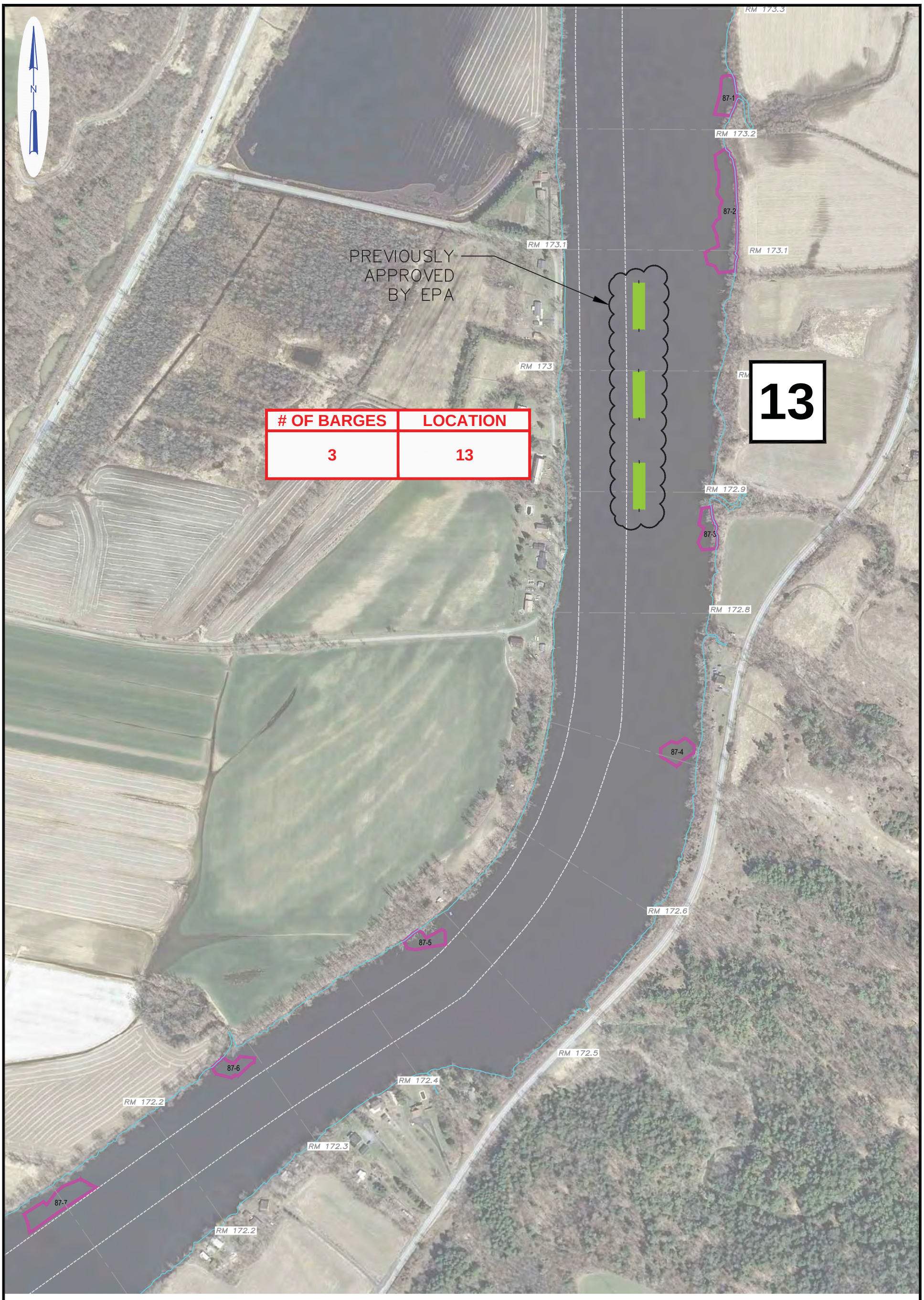

# OF BARGES	LOCATION
3	13

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 13
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5J	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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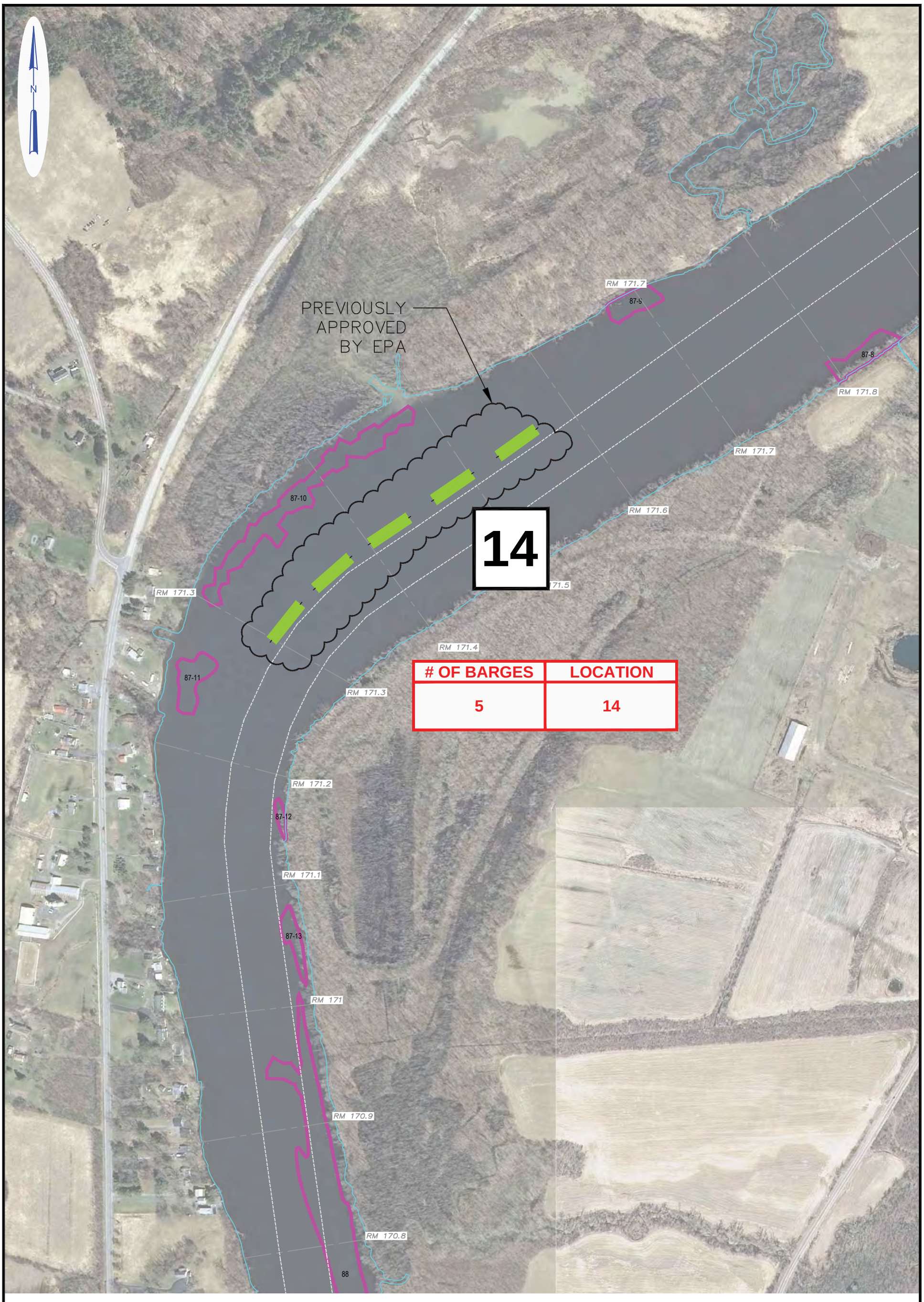

# OF BARGES	LOCATION
5	14

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 14
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5K	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
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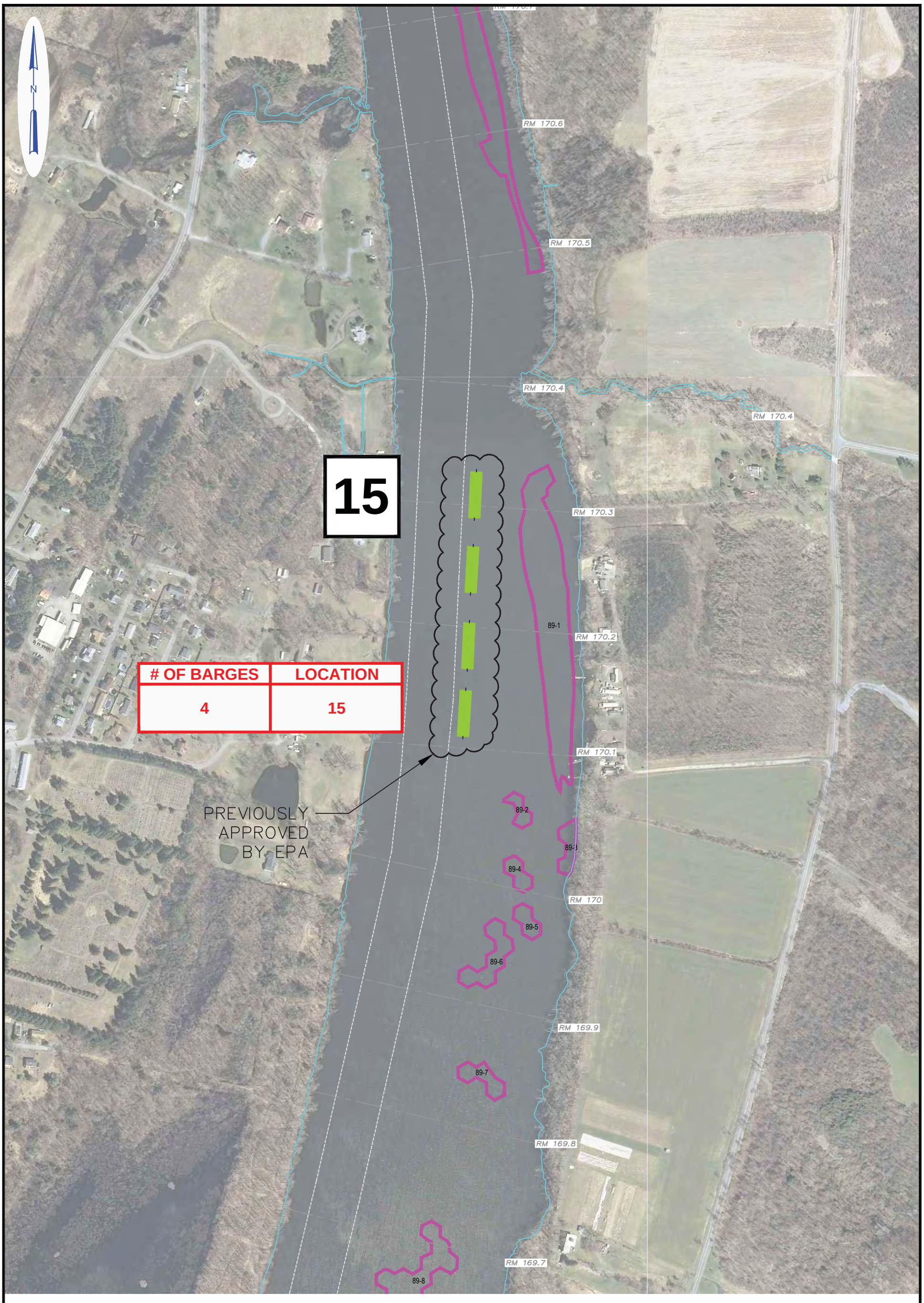

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 15
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5L	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
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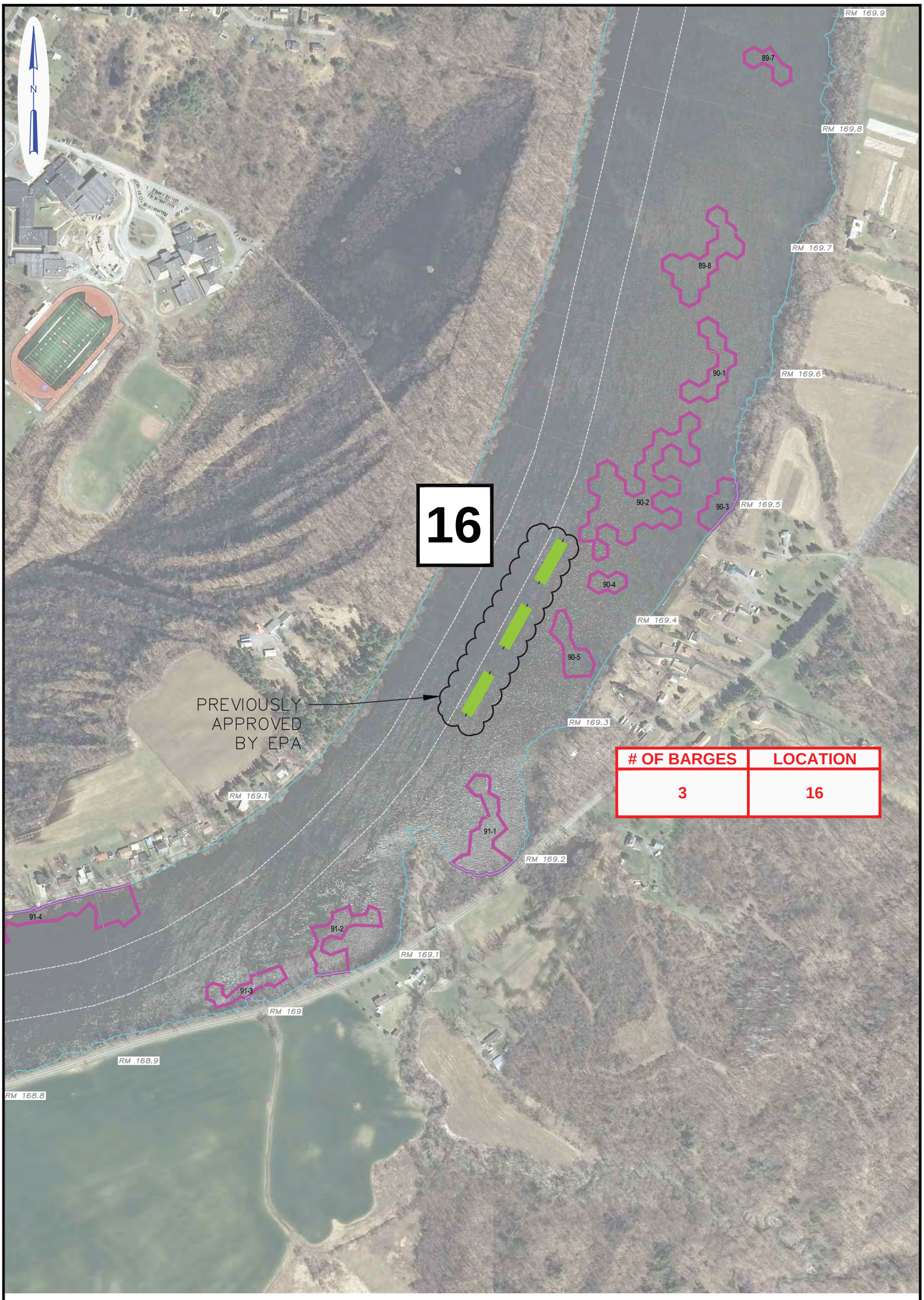

# OF BARGES	LOCATION
3	16

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 83.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 16
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5M	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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# OF BARGES	LOCATION
3	17

# OF BARGES	LOCATION
3	18A

PREVIOUSLY APPROVED BY EPA

17

18A

RM 166.9
RM 166.8
RM 166.7
RM 166.6
RM 166.5
RM 166.4
RM 166.3
RM 166.2
RM 166.1
RM 166
RM 165.9

92-1
92-2
92-3
92-4
92-5
93-1
93-2

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 70.0')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400
BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 17
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5N	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 47.8')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2015 MOORING LOCATIONS
LOCATION 18
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5O	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-5_MOORING_LOC.DWG
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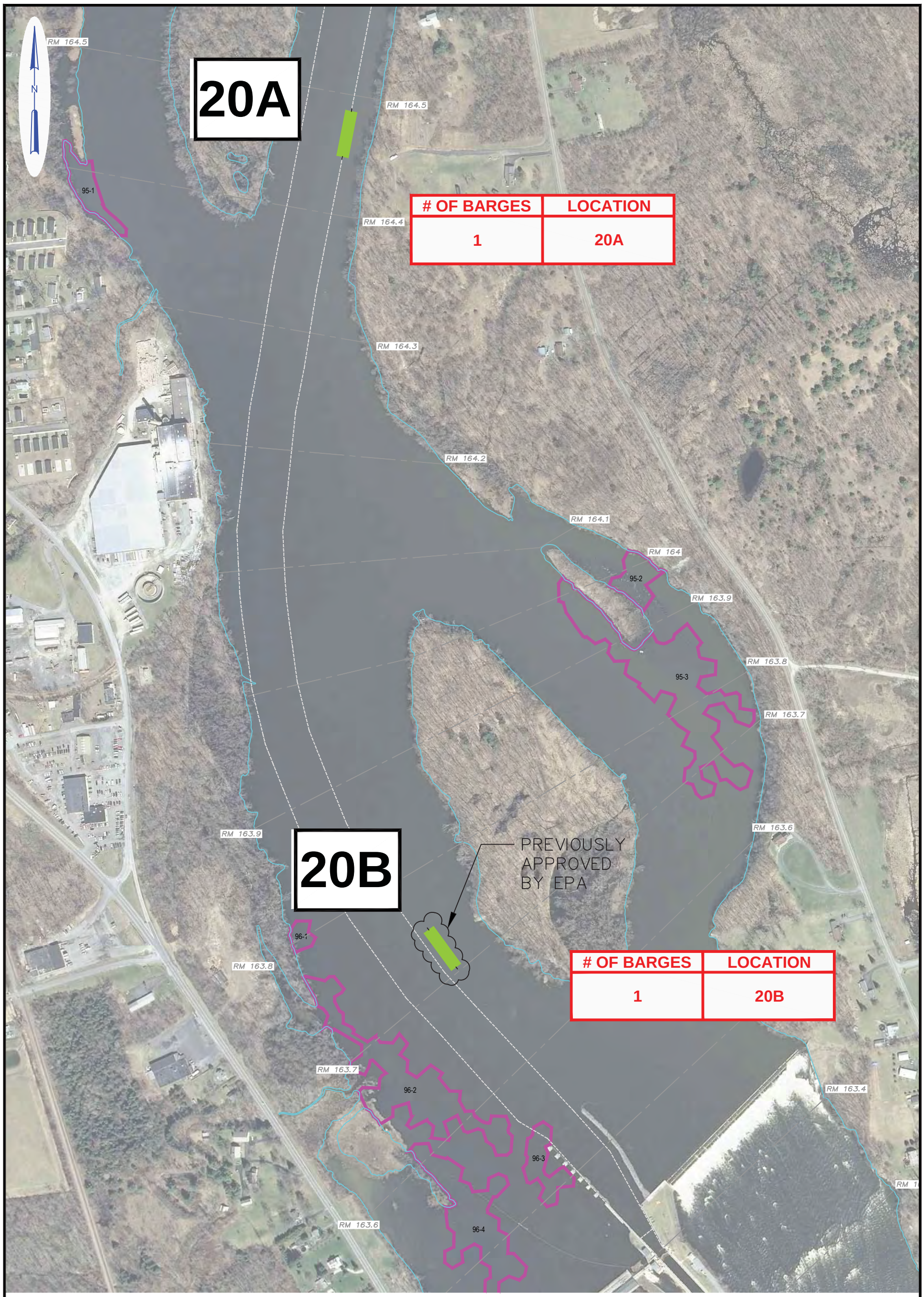

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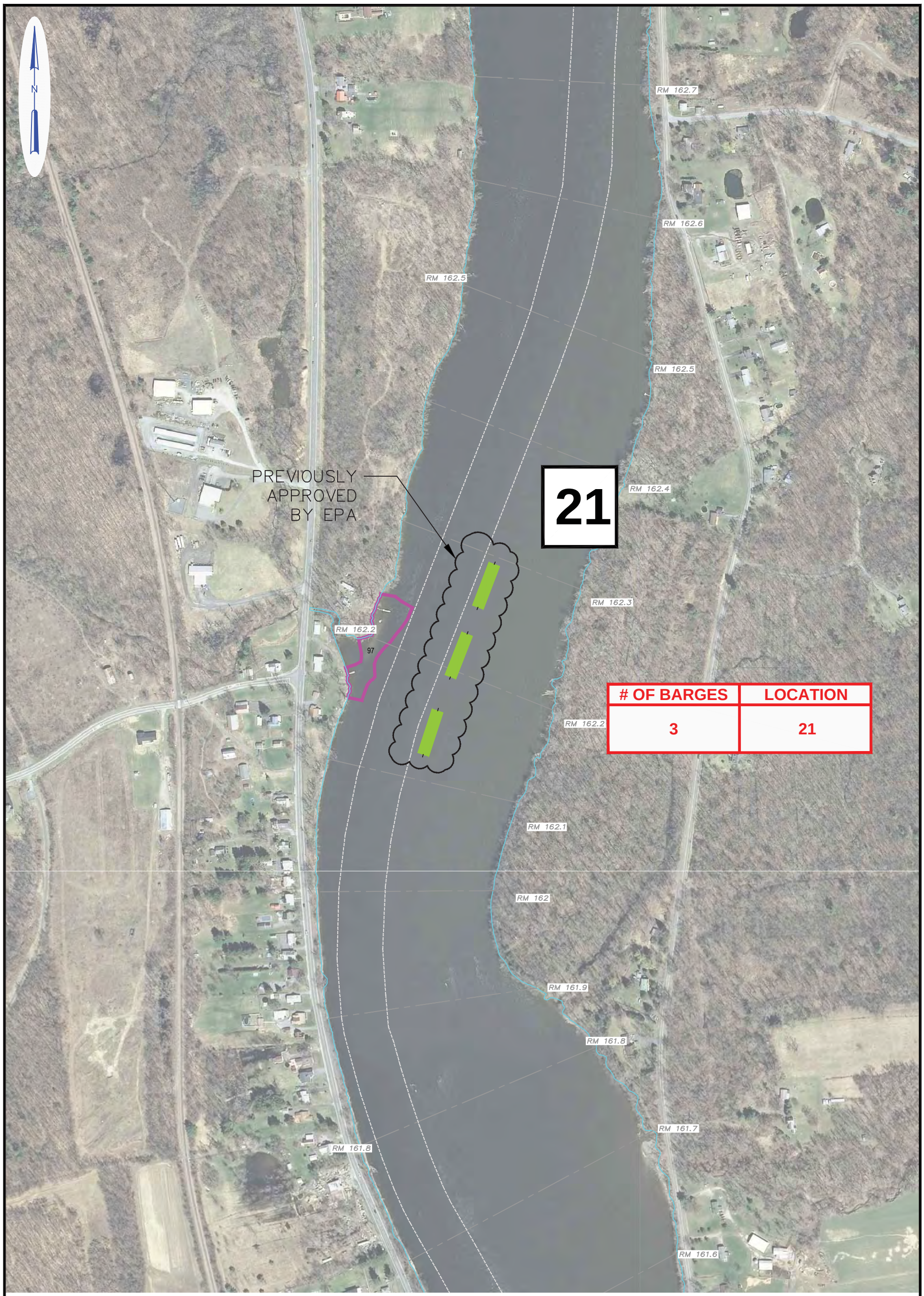
DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2015 MOORING LOCATIONS
LOCATION 20
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5P	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-5_MOORING_LOC.DWG
PLOT DATE: 6/9/2015 2:15 PM PLOTTED BY: SMITH, NICOLE



# OF BARGES	LOCATION
3	21

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 29.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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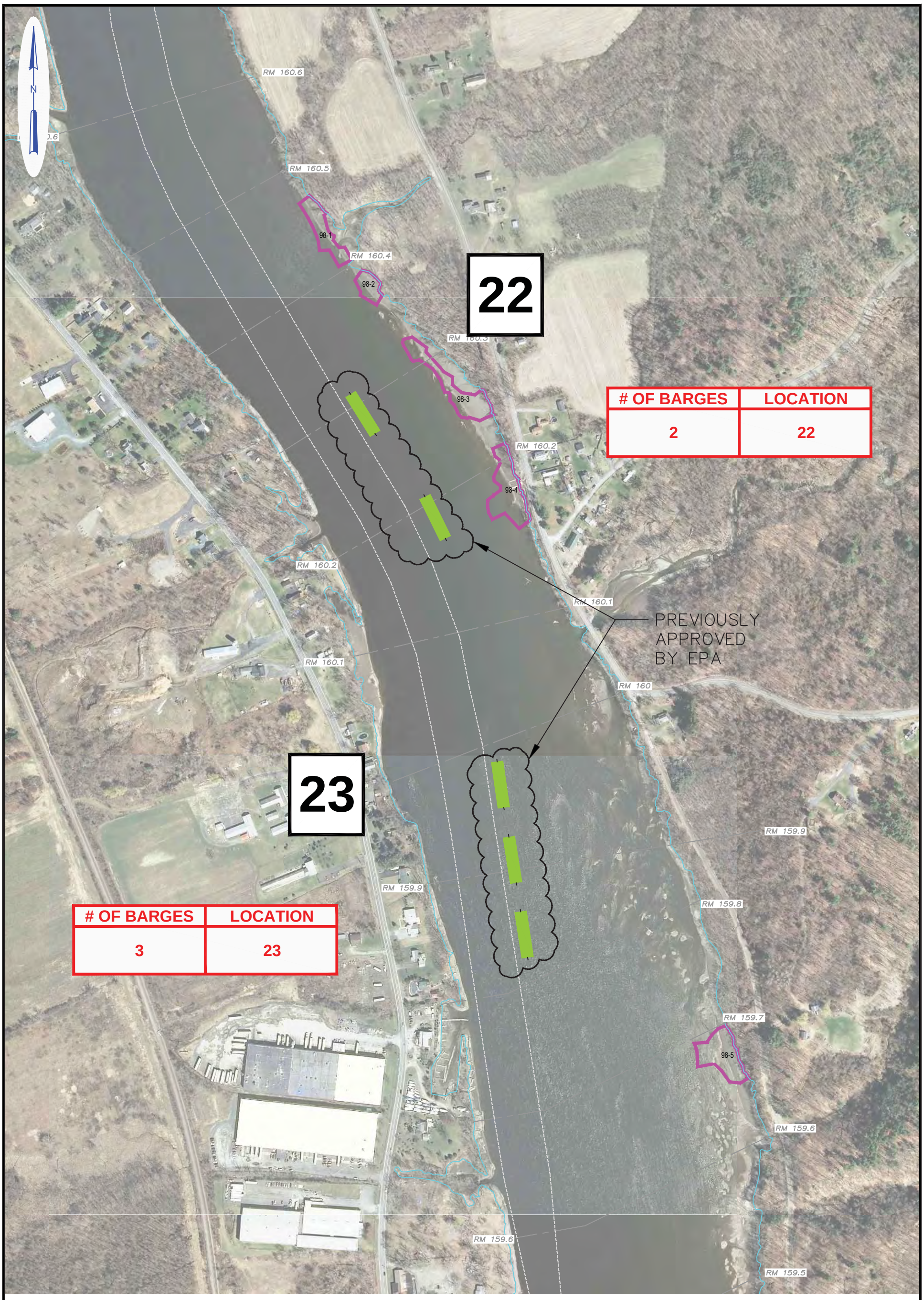
DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 21
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5Q	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
PLOT DATE: 4/29/2015 3:16 PM PLOTTED BY: SMITH, NICOLE



# OF BARGES	LOCATION
2	22

# OF BARGES	LOCATION
3	23

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 29.6')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATIONS 22 & 23
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5R	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_RAWP_2-3, 2-5_MOORING_LOC.DWG
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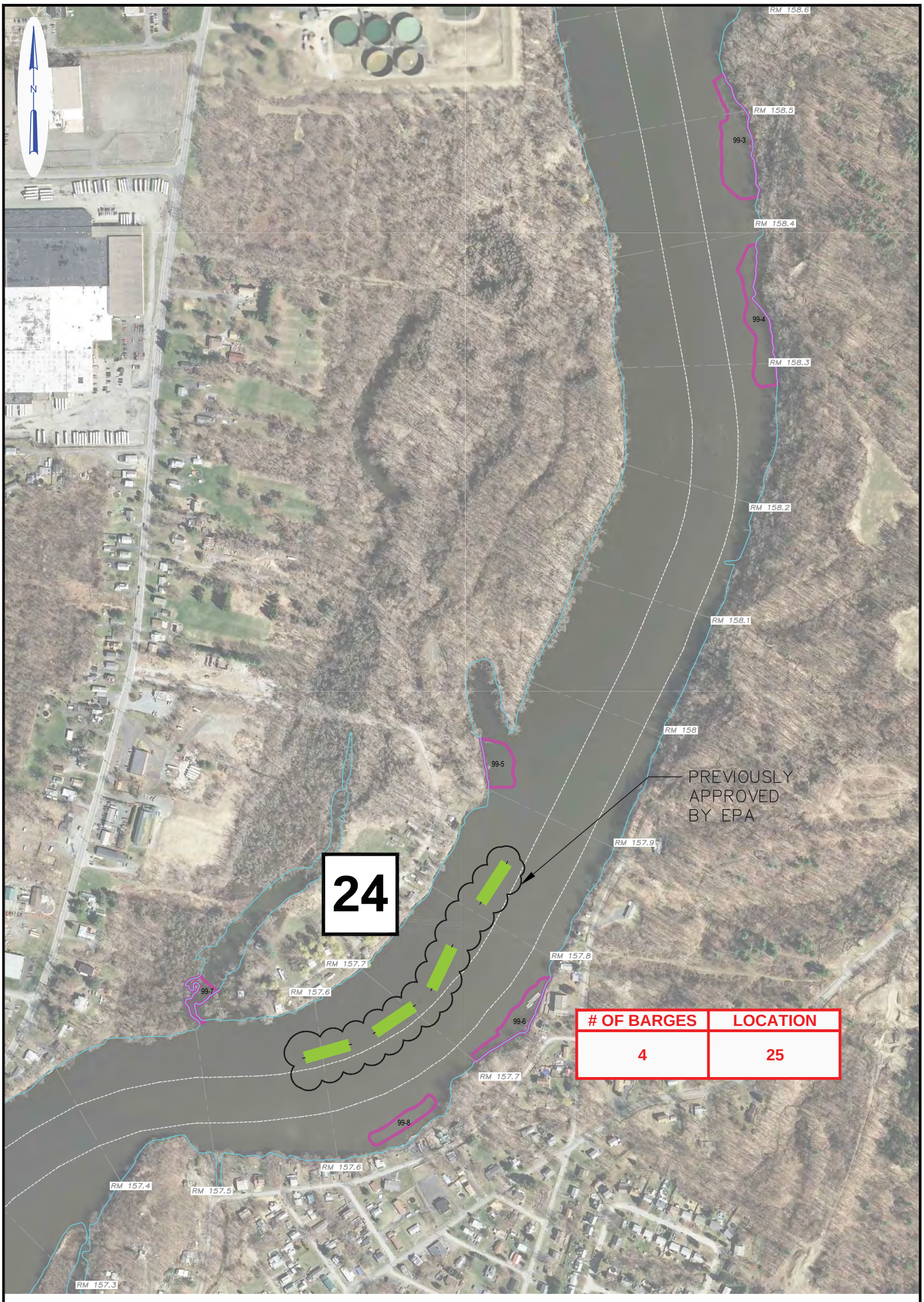

# OF BARGES	LOCATION
4	25

LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 16.0')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- BARGE & BARGE MOORING POST

400 200 0 400

BAR SCALE

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DRAWING TITLE
REMEDIAL ACTION WORK PLAN
2014 MOORING LOCATIONS
LOCATION 24
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
MWB	MG	FIGURE 2-5S	AS SHOWN
DATE	APPROVED BY		JOB NO.
2/3/2015	MG		442209.02300

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2.9 SHORELINE STABILIZATION

Shoreline stabilization includes the installation of short-term stabilization measures at shoreline locations where shoreline failure is observed or locations where there is a concern of such failure after dredging has occurred. Short-term stabilization measures may remain in place through dredging. Short-term stabilization measures may be left in place as part of long-term stabilization measures if they comply with the approved requirements for long-term stabilization measures in the contract drawings. Details of any long-term stabilization measures that differ from those identified in the contract drawings will be provided to EPA for approval prior to installation. Long-term stabilization measures will be installed as shown on the Contract 42A B-series drawings prior to, or as part of, backfilling. Repairs, including planting of vegetation, will be made to disturbed areas of the shoreline above the shoreline elevation contour line (as defined above and depicted in the drawings).

Shoreline stabilization will be accomplished using the methods identified in the Contract 42A Specification 13898 and B-series Drawings. To the extent that access to shoreline properties is required, such access will be sought in accordance with the procedures set forth in the 2015 PAP. Shoreline stabilization will be installed utilizing a barge-mounted excavator equipped with a conventional excavator bucket or hydraulic clamshell bucket. Materials will be placed in essentially the same manner as backfill/cap material placement.

The sequence of work and production rates will be determined by the requirements of the dredging and backfilling/capping operations.

2.10 PLACEMENT OF BACKFILL AND ENGINEERED CAPS

Placement of backfill or engineered caps will be performed by the Dredging Contractor. Upon acceptance of completion of dredging within a CU, or portion of a CU, backfilling and capping requirements will be specified by the CM to the Dredging Contractor. The CM will determine the requirements for backfilling or capping based on the criteria specified in Section 4 of the PSCP and the Contract 42A specifications that are part of the applicable final design, which consider such location-specific variables as remaining PCB concentrations, river velocity, and the designated type of habitat construction. Different forms of backfill and engineered cap designs have been specified for these purposes under various conditions, as described in Section 3.8 of the CUs 85-96 FDR, Contract 42A Specification 02206, and the Contract 42A B- and C-series Drawings in the applicable FDRs. These are briefly described below.

"Near-shore backfill" is backfill to be placed between the shoreline and near-shore elevations presented in Table 2-3, as described in Section 3.8.1.2 of the CUs 85-96 FDR.

Table 2-3 Approximate Backfill Placement Elevations

River Section	Reach	CU's	Shoreline Elevation (NAVD88)	Near-shore Elevation (NAVD88)
Section 3	Reach 3	CU 94-96	47.8	46.2
	Reach 1	CU 99	16	13.5

Near-shore backfill will be placed to an elevation consistent with the existing bathymetry as presented on the applicable Contract Drawings for Contract 42A (G – Drawings Series), and includes the supporting 3:1 (horizontal to vertical) side slope down to the adjoining backfill or cap surface.

"One-foot backfill" is to be placed on the river bottom following the completion of dredging, except in certain areas of the navigation channel as specified in the PSCP and the applicable FDR or in other areas agreed to with EPA. The 1-ft backfill layer can be either Type 1 material or Type 2 material, as specified in the applicable FDR and the applicable Contract 42A-series drawings.

"Habitat backfill" is supplementary backfill material that may be placed in areas in the river that currently support SAV. These locations are shown in the applicable FDR and were selected to meet the requirement in Section 2.7.1 of the CDE for placement of additional backfill with a post-dredging and backfill placement water depth of greater than 8 ft below the design water surface elevation. Potential placement locations for the additional backfill are shown on the applicable Contract 42A-series Drawings, including the final placement.

Once backfill and/or cap chemical isolation layer materials have been placed in a CU, cores will be collected in the backfill and/or the chemical isolation layer material. However, if the results from the first five chemical isolation layer samples collected show that the post-placement total organic carbon (TOC) content of the isolation layer material meets or exceeds the requirement of 2% TOC, further post-placement sampling of the chemical isolation material may be discontinued subject to EPA approval (unless there is a change in the source material, mixing technique or placement method, in which case sampling of that new material for TOC will be re-initiated per this description). Before discontinuing the post-placement sampling the Dredging Contractor will establish the pre-placement TOC content necessary to achieve the post-placement 2% TOC requirement. Pre-placement testing of the backfill with TOC will continue after post-placement sampling has been discontinued to ensure that the necessary pre-placement amount of TOC is present.

2.10.1 Material Sources

The Dredging Contractor has identified a number of sources of backfill and cap materials located in the Upper Hudson River Valley that may be used to provide such materials during 2015. These potential sources, including their locations, are listed in Table 2-4. It is currently anticipated that these sources will provide the necessary quantities and types of backfill/capping materials for 2015. However, if other sources of backfill or cap material are identified, GE will advise EPA of those sources.

Table 2-4 Potential Backfill and Cap Material Sources

Fill Type	Source	Location
Backfill Type 1 Material (Type "1")	Cranesville Aggregate, Inc. Lucarelli Pit	Gansevoort, NY Mechanicville, NY
Backfill Type 2 Material (Type "2")	Lucarelli Pit Brickyard Pit Ward Pit Hemstreet Pit	Mechanicville, NY Schaghticoke, NY Schaghticoke, NY Schaghticoke, NY
Coarse Gravel (Type "N") Cobble Armor (Type "O") Armor Stone (Type "P") and misc. stone	Peckham Quarry Pallette Stone Quarry West Sand Lake Quarry	Hudson Falls, NY / Easton, NY Saratoga Springs, NY West Sand Lake, NY
Anthracite	Blaschak Coal Company Reading Anthracite Co.	Mahanoy City, PA Pottsville, PA
Topsoil	Troy Topsoil	Mechanicville, NY

2.10.2 Backfill/Cap Material Loading Areas

Backfill and capping materials will be transported via truck from their sources to the SBLA (shown on Figure 2-4B) or the RBLA (shown on Figure 2-4D), as appropriate. These areas are considered to be "entirely on-site" for purposes of Paragraph 8.a of the RA CD, as well as Section 121(e) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and 40 Code of Federal Regulations (CFR) 300.400(e). Routes for the transport of the backfill/cap materials from the sources identified in Table 2-4 to the SBLA and the RBLA are shown in Attachment 1. If any other sources are subsequently identified, GE will provide EPA with the routing from those sources to the loading area.

The SBLA and the RBLA consist of a number of components, including, at each, a material stockpile area, access roads, a truck scale area, loading platforms, a conveyor area, and support areas, as described below. In addition, each of these loading areas has a parking lot for dredging operations crews and a boat dock for crews to access crew boats. (The construction, components, and restoration of the RBLA were described in GE's revised Addendum No. 3 to the 2014 RAWP [Parsons 2015d].)

The stockpile area at the SBLA and the RBLA will be used for the temporary stockpiling of backfill and cap materials and the mixing of such materials as necessary to meet the relevant gradation or other specifications for the dredge area where they will be placed. A truck scale is located near the site entrance at the RBLA.

The loading platform at the SBLA and the RBLA consists of stationary barges which are anchored in position with temporary anchors and spuds. This platform includes tie-off locations for the transport barges while they are staged prior to loading. All backfill/cap material except Type P and Type O stone will be loaded into the transport barges via conveyor. The conveyor will have the capability to extend at least approximately 300 ft (at the SBLA) or 200 ft (at the RBLA) from the feed hoppers to the transport barges. Type P and Type O stone, due to its size and shape, if loaded through the SBLA or the RBLA, cannot be effectively loaded into barges with a conveyor so it will be placed into barges using a crane or other heavy equipment.

The operations to be conducted at the SBLA and the RBLA, including stockpiling, mixing, and loading of the backfill and cap material, will comply with the substantive requirements of federal and state laws and regulations that are identified as applicable or relevant and appropriate requirements (ARARs). In addition, these activities will be subject to the Phase 2 QoLPS for noise and lighting as well as project dust and opacity requirements. The noise and light monitoring to be conducted at these areas will be as described in the Phase 2 RAM QAPP, and response actions to be taken in the event of an exceedance of the numerical criteria in those performance standards or in the event of a complaint will be those described in the PSCP. (Since the backfill and cap materials will not contain PCBs, ambient air monitoring to evaluate attainment of the air quality QoLPS for PCBs will not be necessary.)

The SBLA will be used in 2015 to load backfill transport barges to supply material for use in CU 60 in the Thompson Island Pool. The RBLA will be used in 2015 to load backfill/cap material barges to be used in CUs 94-96 and 99. If additional barge loading areas are needed during the 2015 dredging season, GE will seek approval of those properties from EPA.

2.10.3 Transport to In-River Placement Locations

As discussed above, the backfill and capping materials will be stockpiled at the loading area and may be mixed as necessary to meet the specifications for the dredge area where they will be placed. The materials will then be loaded by conveyor or crane into barges for transport to in-river placement areas. Barges carrying backfill or cap materials will be transported to the next available backfill or cap placement rig for placement of the materials onto the river bottom or to an approved mooring location in order to be sequenced in to the backfill or cap placement schedule.

2.10.4 Placement Methods

The Dredging Contractor will perform backfilling and engineered cap placement at the locations and to the thicknesses provided by the CM during construction. The backfill or cap placement operations may utilize similar types of mechanical hydraulic excavator (backhoe) rigs,

with similar platforms and bucket positioning approaches as used for dredging. An open-faced clamshell or excavator bucket or the equivalent will be used.

Backfill/capping "swath" plans will be developed by the Dredging Contractor for the backfill/cap areas, to provide the operator and project management personnel a guide by which to accurately and uniformly place the backfill/cap material. Based on the fill volume of the bucket and the width of the bucket when swung partially open, the Dredging Contractor will calculate and program swath lengths and patterns into the positioning software for the placement of material to the required lines and grades. Backfill and cap materials will be placed in accordance with the tolerances in the EPA-approved construction contract documents. Based on prior experience gained during previous dredging seasons, backfill or cap material will be released above the water surface to control placement accuracy and lift thickness.

The Dredging Contractor may choose to modify or change the method and equipment to place backfill or cap materials. Such changes will be proposed to the CM and EPA for approval.

Survey stakes at approximately 50-ft intervals will be installed prior to RFW construction at the land-side perimeter of each RFW area to be constructed during the 2015 dredging season. The shoreline elevations associated with each pool are presented in Table 2.2

The wave break berm to be used at RFW construction areas, in accordance with the approved applicable FDR, will consist of a fabric-wrapped Type 2 backfill berm. After the RFW backfill has been placed and the erosion control fabric has been placed over the accepted RFW backfill area, the Dredging Contractor will hand apply Zone A or Zone B seeds as appropriate based on final elevations. In the event that Zone A areas are inundated, the Dredging Contractor will install the erosion control fabric where required and will hand apply the seed at a later time when the area is no longer inundated.

2.10.5 Positioning Control

The Dredging Contractor is required to establish an accurate method of horizontal and vertical control before it proceeds with any backfill/capping operations, subject to the approval of the CM. For this purpose, the Dredging Contractor will employ RTK DGPS to locate and control the horizontal position to within ± 3 inches. Control of the bucket for backfill and capping operations will be achieved with DredgePack (or equivalent) software utilizing a dual antenna RTK DGPS system mounted directly to the excavator. This provides RTK horizontal and vertical positioning in addition to the heading of the excavator. A series of rotary sensors collects orientation (angle) information. These angles will be utilized in calculations performed by DredgePack (or equivalent) in conjunction with the lengths of each of the excavator components to calculate the position of the bucket.

Sensor information will be transmitted to the guidance computer mounted in the excavator cab. A DGPS system utilizing moving base station RTK technology (CSI Vector or similar) will provide the position and heading of the backfill/cap placement platform. The dredge guidance software receives sensor information and displays the location of the platform and the three-

dimensional location of the bucket. This information is displayed in the operator's cab. Sensors used in the positioning system will be calibrated according to manufacturer's instructions. Checks will be performed on the positioning system prior to the backfilling operation to confirm that specifications are met. Periodic checks with a separate GPS unit will be conducted to verify that the sensors are performing in accordance with the specification for horizontal positioning.

2.11 HYDROGRAPHIC SURVEYING DURING DREDGING OPERATIONS

GE will provide a third-party independent surveyor to conduct multi-beam hydrographic surveying for use in construction QA and progress reporting. This surveyor will conduct a hydrographic verification survey of each CU or portion thereof once notified by the Dredging Contractor that particular work in a CU, i.e., a dredging pass or placement of backfill/cap material, has been completed. Third-party surveyor methods and procedures are discussed in the 2015 DQAP (Appendix A).

To increase the efficiency of the CU acceptance process, the CM may direct the third-party surveyor to commence CU acceptance surveys in portions of a CU that have been deemed complete by the Dredging Contractor while the Dredging Contractor finishes dredging or placement of backfill/cap material in other portions of the same CU.

The Dredging Contractor may conduct its own multi-beam or single-beam hydrographic survey to verify that an area has been successfully dredged prior to the request for the third-party surveyor. As described in Section 2.1, in 2012, it was established that the Dredging Contractor's survey data was consistent with the third-party hydrographic surveyor's surveys, and GE used the Dredging Contractor's survey data to confirm that the first pass dredge prism limits have been achieved. This practice was continued in 2013 and 2014 and may continue in 2015, with EPA approval, once consistency of the Dredging Contractor's survey data has been verified.

2.12 DEMOBILIZATION ACTIVITIES

This section describes the demobilization activities to be conducted by the Dredging Contractor, including decontamination of equipment. Demobilization of the equipment and temporary facilities and foundations used in CUs 95-2 and 95-3 is also discussed in Section 2.13.5 below. Demobilization of the sediment processing facility is described in GE's separate *Phase 2 Sediment Processing Facility Demobilization and Restoration Plan* (Arcadis 2015b).

Demobilization is the process of taking apart equipment, transporting equipment away from the job site, dismantling support facilities, removing temporarily installed structures and equipment, and general cleaning up of work areas. A summary of the activities that may be performed during dredging operations demobilization is provided below:

- Dismantle and remove field offices including project administration buildings.
- Remove signage, and other community protections.
- Remove any project survey equipment such as base stations.

- Remove and dismantle floating equipment that will be trucked off-site.
- After required decontamination and once CM approval has been received, transport equipment off-site.
- Remove any unused materials on site or move stockpiles to locations designated by the CM.
- Clean up work areas including the Work Wharf.

On-site equipment used for dredging operations is expected to come into contact with contaminated sediment. As project operations proceed and backfill or capping operations start, clean equipment designated for backfill/capping work may be brought on site or equipment used for dredging may be shifted to backfill/capping work. Barges, excavators, and any other equipment used for dredging will be decontaminated prior to their use for backfill and capping operations. The equipment decontamination procedure is a multi-step process, as outlined below:

1. Remaining sediment will be physically removed from equipment surfaces through use of shovels, brooms, and other hand tools as necessary to clean surfaces.
2. If any additional contaminated sediment is visible, equipment surfaces will be washed, using pressure washers where appropriate, to ensure removal of any sediment that may remain. Washing will be done in an area designated for that purpose (see step 7 below) and water from the wash operation will be collected and treated.
3. All equipment will be visually inspected as "clean" prior to transfer for use in backfill/capping operations.
4. A daily log will be kept for equipment designated for dredging versus backfill/ capping. Equipment will be appropriately marked as designated for dredging or backfill/capping to prevent the potential for cross contamination.
5. An equipment decontamination status report will be provided to the CM every morning. This report will document the equipment status for continued operation. A decontamination documentation report will be provided to the CM to certify that decontamination has been completed on all equipment before it is demobilized.
6. The equipment decontamination location(s) will be established to provide the most flexibility to the Dredging Contractor to ensure that it can adequately and timely decontaminate the necessary equipment.
7. It is expected that most of the equipment decontamination activities will occur inside a hopper barge or on a deck barge that has raised sealed edges. This is the preferred method since all of the activities can be performed inside the barge using the walls and floor as containment of decontamination fluids and solids. A collection area will be established to allow for the removal of decontamination liquids and solids either through a pumping system or vacuum system. This material will then be transported to the unloading wharf for proper unloading and disposal by others.

Equipment such as spuds, excavator buckets, and miscellaneous steel sections will be lowered into the hopper barge, where it will be decontaminated. Cleaned equipment will be raised out of the hopper barge and stored on land in a designated area for final decontamination verification.

There are two levels of decontamination that are established for the project. The first level is for equipment that will remain dedicated to project use and may be used for other operations, such as backfilling, or be stored for potential use in future years of work. The standard of decontamination for equipment that will remain dedicated to future potential project use is the removal of all visible sediment on the surface of the equipment. The second level of decontamination is for dredging equipment that will no longer be used on the project. The standard of decontamination for such dredging equipment is the removal of visible material and further power washing of surfaces so that the cleaned surface can be wipe tested to show that low-contact surfaces contain less than 100 µg PCBs per 100 cm^2 and high-contact areas (e.g., hand rails) contain less than 10 µg PCBs per 100 cm^2.

2.13 DREDGING OPERATIONS IN CU 95-2 AND CU 95-3

This section covers the dredging operations in CU sub-units 95-2 and 95-3, which are shown on Figure 2-6. Dredging and associated activities in these CU sub-units will be conducted in accordance with previous sections of Section 2 of this 2015 RAWP with the exception of several modifications described in this section. These modifications were developed because, as discussed further below, these areas have restricted access due to bedrock that creates shallow water and precludes access to the dredge areas with large equipment and vessels. The design revisions for CUs 95-2 and 95-3 are also described in Section 3 of the 2015 Design Revisions (Arcadis, 2015a).

The 2014 RAWP (Parsons, 2014c) indicated that the approach for accessing the portion of CU 95 east of Quack Island, which contains CUs 95-2 and 95-3, could not be finalized until additional multi-beam bathymetric data and sediment probing data could be obtained. In 2014, bathymetric data and probing data were collected to further understand this area. The additional bathymetric data collected in the area south of CUs 95-2 and 95-3 identified shallow areas that precluded accessing the area from the south access channel with large equipment and vessels. The additional probing data collected in the area north of CUs 95-2 and 95-3 showed that the entire area was underlain by shallow bedrock that precluded accessing the area from the north access channel with large equipment and vessels. In 2014, test excavations witnessed by EPA in the northern approach were also made using an excavator and conventional excavating bucket to ascertain if access dredging was feasible. The rock layer was not penetrated using this technique. Thus, a combined land- and water-based approach to dredging in CUs 95-2 and 95-3 has been developed.

Under this approach, the sediment in CU 95-2 will be removed and backfill materials will be placed using a land-based excavator, but the sediment in CU 95-3 will be removed and backfill

materials will be placed using a regular floating dredge/backfill placement platform. A support property and access roads will be constructed between River Road and the Hudson River to the north of CU 95-2. The support property (River Road Staging Area) will be used to stage backfill and cap materials prior to placement in CU 95-2 as well as for mobilization and demobilization of the equipment necessary for CUs 95-2 and 95-3. Construction of the River Road Staging Area and access roads and dredging and backfill activities in CU 95-2 will be conducted only during daylight hours. The following subsections describe the proposed approach. GE has obtained access to the property necessary to implement this approach. A site layout showing the components of the approach to be implemented in CUs 95-2 and 95-3 is provided in Figure 2-7. Demobilization and restoration of the land-based facilities are described in Section 2.13.5.

2.13.1 River Road Staging Area, Access Road, and Transload Station

In order to provide land access to CUs 95-2 and 95-3, the River Road Staging Area will be constructed on a property that has access to River Road and also abuts the Hudson River. An Access Road will then be constructed from the River Road Staging Area to the end of the unnamed island and to the north of CU 95-2. Two small bulkheads will then be constructed to allow: (1) equipment to be mobilized onto the floating platform to be used for dredging and backfill/cap material placement in CU 95-3; and (2) sediments dredged from CU 95-2 to be transloaded from trucks into shallow draft hopper barges.

Construction will commence with improvements to the existing driveway that leads from River Road to the lower portions of the property, where an area will then be cleared and graded to create the River Road Staging Area. The Access Road will then be extended out into the river to the unnamed island and then over the island to CU 95-2. Then, the transload station will be constructed.

Prior to construction, a Stage 1A archaeological resources survey was conducted on the River Road Staging Area parcel, and a report has been submitted to EPA (URS, 2015b). Site reconnaissance conducted on the parcel did not identify any significant cultural features. Cultural and archaeological investigations within CUs 95-2 and 95-3 were previously completed (URS, 2014a, 2014b), including the unnamed mud island and the area where the Access Road will be constructed, and were approved by EPA.

The River Road Staging Area will be used to deliver the various types of fill material necessary to construct the Access Road and then to stage the backfill materials necessary for CU 95-2. The River Road Staging Area will also be used to stage and mobilize the equipment necessary to dredge CU 95-2 and to stage and load the dredge for CU 95-3. No sediments containing PCBs will be offloaded at the River Road Staging Area.

2.13.1.1 Vegetation Removal

The contractor will remove only the trees and vegetation necessary for the construction of the River Road Staging Area and the Access Road. A visual tree survey and GPS will be used to identify and locate all trees that will affect the operations. Where space, size and safety

considerations permit, trees will be felled in one piece. Clearing of small brush vegetation may be done with a brush mower. Trees, log sections, and brush less than 12 inches in diameter will be processed with a large brush chipper, discharging wood chips into controlled piles adjacent to the area being cleared. Logs greater than 12 inches in diameter will be cut into 8-ft lengths and staged. All cut logs will be delivered to the location on the parcel designated by the property owner. Wood chips will either remain on site or be hauled to either the Washington County Transfer Station located on Rt. 196 in Kingsbury, NY or the Easton or Fort Ann Washington County Highway Department facilities for reuse by the Washington County Highway Department.

Stumps will be ground or removed by excavators as required for the construction of the River Road Staging Area or the Access Road.

2.13.1.2 Erosion Control

Site erosion and sediment controls will be implemented at the River Road Staging Area and the Access Road during work in CUs 95-2 and 95-3. Monitoring of these controls will be documented in accordance with the Storm Water Pollution Prevention Plan (SWPPP) prepared by the contractor and stored on-site. To prevent the tracking of sediment onto the adjacent public roadway, a stabilized construction entrance will be installed at any location where vehicles are expected to enter and/or exit the site. The stabilized construction entrance will be constructed wide enough to cover the entire width of the entrance/exit and allow two vehicles to pass comfortably. Where it meets the public roadway, it will also be flared to accommodate longer construction vehicles. The stabilized construction entrance will be long enough to allow soil or sediment on the vehicle tires to become dislodged from tires before the vehicle enters the public roadway.

After the installation of the construction entrance and clearing and grubbing, a silt fence will be installed around the perimeter of the staging area to prevent sediment-laden runoff from leaving the site. The silt fence will be inspected for rips, tears, and gaps between the fence and the ground. An adequate reserve of silt fence will be kept on site at all times for emergency and/or routine replacement. The silt fence will be removed only after exposed soils in the contributing drainage area are stable. A natural undisturbed vegetated buffer will be maintained beyond the limit of disturbance.

Stockpiles of erodible material, including any topsoil removed during construction, will have a perimeter sediment control (such as silt fence or haybales) installed on the pile's downgradient side to prevent storm water runoff from being contaminated by eroded sediment. Stockpiles of erodible material that remain inactive for more than 14 days will be subject to a temporary stabilization technique. Slopes will be left in a roughened condition in order to reduce erosion by decreasing slope length and runoff velocity, increasing infiltration, trapping sediment. The roughened impressions will be made perpendicular to the slope contours. If additional slope stabilization is necessary, it will be done using aggregate, crushed stone, or riprap as conditions may warrant.

2.13.1.3 Access Road and Transload Station Construction

Following the construction of the River Road Staging Area, construction of the Access Road will commence. An approximate 30-ft wide access road will be constructed from the River Road Staging Area to the unnamed island and across the unnamed island to CU 95-2 and also to the CU 95 transload station in CU 95-3. This access road will be constructed of a base layer of Type 2 backfill material placed directly on the river bottom or island surface and then topped with a layer of dense graded stone material, with geotextile fabric and crane mats as appropriate, to provide an adequate surface for truck traffic. Once the access road has been constructed, a concrete block bulkhead will be constructed at the southwest tip of the unnamed island to provide the temporary bulkhead for the transload station. The concrete block bulkhead will then be backfilled with Type 2 backfill, with a top surface of crane mats or equivalent to provide a working surface for the transload excavator.

2.13.1.4 Fill Material Sources

As part of the civil work construction, a variety of fill materials will be used for grading, structural fill, base material, and bedding. All fill material imported for the construction of the River Road Staging Area and the Access Road will be certified clean fill. Table 2-5 details the proposed sources for the fill materials necessary to construct the River Road Staging Area and the Access Road, as well for use as backfill in CU 95-2.

Table 2-5 CU 95 Potential Backfill and Cap Material Sources

Backfill/ Cap/ Fill Type	Source	Location
Sand	Lucarelli Pit	George Thompson Rd., Mechanicville, NY
Backfill Type 2 Material (“Type 2”)	Lucarelli Pit	George Thompson Rd., Mechanicville, NY
Dense Graded Crushed Rock	Peckham Materials Corp	438 Vaughn Road, Hudson Falls, NY
Topsoil	Troy Topsoil	748 Hudson Road, Mechanicville, NY

The truck routes from these sources to the support area for CUs 95-2 and 95-3 are shown in Attachment 2.

2.13.2 Dredging and Backfill Placement in CU 95-2

As noted above and discussed with EPA, dredging of CU 95-2 will be performed using a land-based approach because bedrock creates shallow water depths and thus precludes access to this area with large equipment and vessels. Due to this land-based approach, several modifications to the regular dredging and backfilling approach have been made for CU 95-2, as discussed in this section.

CU 95-2 will be dredged from land using a track-mounted long-reach excavator outfitted with a 2 cubic yard open excavator bucket. The open excavator bucket allows the excavator to have a longer practicable reach than if a clamshell bucket were to be employed and also minimizes the amount of water that is dredged with the sediment. The dredging will be conducted in a single pass to a depth that is 12 inches deeper than the EoC. A silt curtain will be placed downstream of dredging in CU 95-2, as shown in Figure 2-7, to reduce the downstream transport of any resuspended sediments during dredging.

The long-reach excavator will access CU 95-2 by way of the River Road Staging Area and the Access Road. Sediment dredged by the long-reach excavator will be loaded into a material transfer truck that will transport the material the very short distance to the transload station located at the south west tip of the unnamed island. At the CU 95-2 transload station, the truck will be unloaded by a second long-reach excavator into shallow draft hopper barges that will then be transported to the transload dredge in deeper water close to the NYSCC navigation channel for transloading into a regular hopper barge and transport to the sediment processing facility in Fort Edward. The shallow draft hopper barge will be transported using a shallow-water vessel powered by a jet drive outboard motor. The propeller-less motor will be used due to the shallow water depth and rocky bottom.

The dredging of CU 95-2 will commence with the excavator dredging the reachable sediment in CU 95-2 from the Access Road.

Once the excavator has dredged to the limits of its reach from the Access Road, finger piers will be constructed into CU 95-2 as shown in Figure 2-7. Each finger pier will be constructed incrementally as follows:

1. The excavator will dredge the reachable footprint of the finger pier to a depth of 12 inches below the EoC and place the dredged sediment in the material transfer truck for transport to the transload station.
2. Once the required elevation is reached, the excavator will place a base layer of 12 inches of Type 2 backfill in the dredged footprint of the finger pier, followed by the placement of additional Type 2 backfill material, supplemented with densely graded crushed stone where necessary to add structural stability, to construct the finger pier to the necessary elevation.
3. The excavator will move forward onto the newly constructed portion of the finger pier.
4. Crane mats or another similar temporary running surface will be installed over the constructed portion of the road to provide a stable running surface for the truck. (The excavator will not need to be located on crane mats so the outer portion of each finger pier will only have a top surface of Type 2 backfill material or densely graded crushed stone.)
5. Steps 1, 2, 3, and 4 will be repeated until the full length of the finger pier is constructed.

These finger piers will allow the long-reach excavator to travel by land away from the unnamed island and extend its reach to dredge the remaining portions of CU 95-2. Once each finger pier has been constructed, the excavator will dredge the sediment that it can practicably reach from that finger pier and place that sediment in the material transfer truck for offloading at the CU 95-2 transload station. The fully constructed finger pier configuration will allow the excavator to dredge to the limits of CU 95-2.

When the limits of the reach of the excavator have been dredged to the required grade from the finger pier, the long-reach excavator will commence placing the base layer of Type 2 backfill in the reachable area from the finger pier, beginning at the outer limit. Backfill materials will be staged at the River Road Staging Area, loaded into the material transfer trucks by a front-end loader, and transported to the long-reach excavator in CU 95-2 for placement. After the Type 2 backfill has been placed over the reachable area adjacent to the finger pier, the excavator will place the Type 5 top layer. After the Type 5 top layer has been correctly placed, the excavator will step back and remove the crane mat or other temporary running surface on that portion of the finger pier. The excavator will then remove the underlying crushed stone, if any, and Type 2 material from the finger pier above the prescribed base layer backfill elevation and spread that material adjacent to the completed backfill area as a new base layer. Additional Type 2 material will be placed to achieve the correct base layer, and then the excavator will place a minimum of 12 inches of the Type 5 top layer to the required RFW elevations. This sequence will be followed for each finger pier until the finger piers and adjacent area of CU 95-2 have been backfilled.

During the road and finger pier construction, dredging, road and pier removal, and backfilling, the CM representative will confirm that the Dredging Contractor has removed visible sediment from the open excavator bucket before the bucket is used to place clean backfill and Access Road or finger pier materials. Additionally, any visible sediment observed on the finger pier will be removed and transported via truck to the transload area for disposal. Similarly, before transport trucks switch from transporting dredged material to transporting backfill or other clean material, all visible dredged sediment will be removed from the truck dump body interior.

Verification that the target elevation has been dredged will be performed using the Dredge Bucket Position System (DBPS). This system will utilize the Hypack Dredgepack software and will also be used, in conjunction with backfill material volume estimates, to confirm that backfill has been placed to the required elevations. The configuration will be similar to that used for other portions of the dredging project. RTK GPS positioning will be utilized to establish the position of the excavator. Angle sensors mounted on the machine's boom, stick, and bucket will measure the relative angles and allow the DBPS to calculate the position of the cutting lip of the bucket in real time. The DBPS will provide the operator with a view of the bucket track and the elevation of the tip of the bucket on a predetermined time interval over that bucket track. The DBPS will also include a target elevation line on the operator's screen that is set at 0.3 ft below

the required prism elevation. The operator will move the bucket along the target elevation line or below the target elevation line on the last cut within the excavators swing radius.

During dredging, the DBPS will record the dredge bucket elevation. The DBPS will output a 1 ft x 1 ft xyz file of the final bucket elevations. That file will be used to generate a map showing the average of the deepest bucket elevations on a 10 ft x 10 ft grid. The elevations of the 10 ft x 10 ft grid will be used to confirm that dredging has achieved the required elevations within the specified tolerances. In addition, the dredging contractor will define the "top of slope" of the area to be backfilled based on the accepted area that has achieved the required elevations as identified by the 10 ft x 10 ft grid. The "top of slope" will be set by the dredging contractor by allowing for a 3:1 slope of backfill material and a minimum 5-ft buffer zone to the edge of the accepted dredge area. The top of slope backfill area limit will be visible on the excavator operator's screen. Once a finger pier has been constructed to the "top of slope" limit, the excavator will advance onto it and begin the process of dredging the next step in the CU sub-unit.

Due to the very shallow approaches surrounding CU 95-2, in-river confirmatory surveys will be conducted using land survey techniques to verify the dredged elevation after the initial dredging pass. These land-based surveys will be performed by an independent third-party survey contractor to verify dredging removal limits and tolerances. Sediment cores will not be taken due to the requirement to sequentially construct the fingers as dredging progresses and the limited size of the area. However, as noted above, dredging will be performed to a depth of 12 inches deeper than the EoC. Once the initial dredge pass elevations are achieved, the area dredged will be considered ready for backfill.

Following placement of backfill, the DBPS will be used to record the elevation of the backfill placed. Elevations for the base layer of backfill will be verified by touching the bucket to the material surface and recording the elevation. These backfill elevation verification with the bucket will be performed on a 10 ft x 10 ft grid using the average of a minimum of three bucket elevation measurements in each grid cell. However, the Type 5 top layer elevations will be confirmed using land survey techniques.

2.13.3 Dredging in CU 95-3

CU 95-3 will be dredged by a floating platform-mounted excavator equipped with an enclosed clamshell bucket, as described in Section 2.6.1. In order to access the CU 95-3 area, the floating work platform will have its excavator, ballast, and other heavy equipment removed. This will reduce the platform's draft to the point that it can be floated over the shallow north access channel into CU 95-3. Once the platform has been successfully floated into the CU 95-3 area, the excavator and other heavy equipment will then be walked down the Access Road and across the bulkhead and will be re-installed onto the platform.

Once the dredge platform has been properly configured, dredging of CU 95-3 will commence. Sediment will then be dredged and placed in shallow draft hopper barges. The

loaded shallow draft hopper barges will then be transported to the transload dredge in deeper water close to the NYSCC navigation channel for transloading into a regular hopper barge and transport to the sediment processing facility in Fort Edward. The shallow draft hopper barge will be transported using a shallow-water vessel powered by a jet drive outboard motor.

Confirmation that the required elevations have been met and residual sampling will be conducted in CU 95-3 as described in Section 2.6.1 above. Additional dredge passes will be conducted in CU 95-3 as necessary to achieve the Residuals Standard requirements provided in the PSCP.

2.13.4 Placement of Backfill and Engineered Caps in CU 95-3

Placement of backfill and engineered caps, as required under the PSCP criteria, will be conducted in CU 95-3 as described in Section 2.10. Backfill and cap materials will be transloaded by the transload dredge from deck barges, located in deeper water close to the NYSCC navigation channel, into shallow draft hopper barges for transport to the CU 95-3 backfill and cap placing platform. The shallow draft hopper barge will be transported using a shallow-water vessel powered by a jet drive outboard motor.

2.13.5 CUs 95-2 and 95-3 Demobilization and Restoration

After the backfill placement is complete in CUs 95-2 and 95-3, all equipment and temporary facilities and foundations will be removed and the affected areas restored. The Access Road will be removed and the land portions of the Access Road will be repaired consistent with the relevant portions of the FDR regarding disturbed areas above elevation 46.2 ft (NAVD88). In particular, the unnamed island used for part of the Access Road will be restored to its pre-existing condition. The Type 2 material in the portion of the Access Road placed in the river will be removed to an elevation 12 inches below existing grade, with Type 5 material placed over the Type 2 base layer as the Access Road is being removed. The Access Road area will be replanted with the required RFW plantings as part of 2016 habitat planting operations. The land-based River Road Staging Area will be restored consistent with the agreement with the property owner. This will include removal of all excess material, removal of all equipment, removal of stone from agreed-upon areas of the site, grading of the site to drain, reconfiguring the driveway to a 12-ft width, placement of topsoil, and stabilization of the site. In addition, as discussed with EPA, the wetland area within the River Road Staging Area will be restored to its pre-existing condition to the extent practicable.

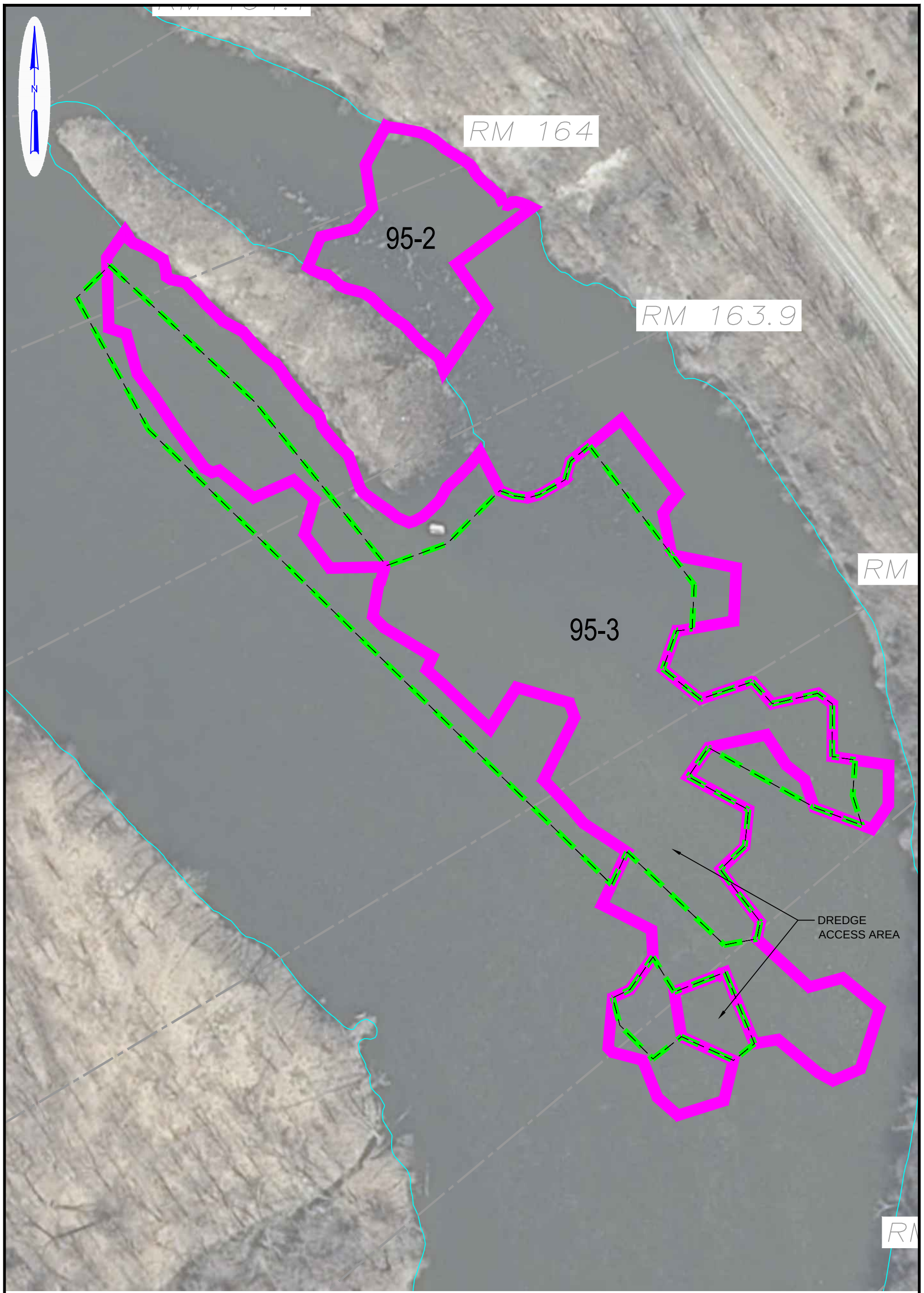
2.13.6 Resuspension Monitoring

The Phase 2 RAM QAPP specifies that near-field monitoring should be conducted approximately 300 meters downstream of dredging operations and that far-field monitoring is to be conducted in an area of the river greater than one mile downstream from dredging. During operations in CUs 95-2 and 95-3, due to the close proximity to the Lower Mechanicville Dam, near-field resuspension monitoring will be established below the Lower Mechanicville Dam at

River Mile 162.9, and far-field monitoring will be conducted at the automated Waterford monitoring station.

2.14 DREDGING-RELATED ACTIVITIES NEAR EAGLE NESTS

Based on discussions with EPA, a Conservation Measures Plan has been developed for 2015 dredging activities in the vicinity of bald eagle nests. That plan is provided as Attachment 3.



LEGEND

- CU # — CU BORDER
- SHORELINE (ELEVATION 119')
- NAV CHANNEL
- RM 192.1 — RIVER MILE MARKER
- DREDGE ACCESS AREA

100 50 0 100

BAR SCALE

PARSONS
COMMERCIALTECHNOLOGY GROUP
GE COMPANY - PARSONS PROJECT OFFICE
BUILDING 40-2, 381 BROADWAY
FORT EDWARD, NEW YORK 12828 (518) 746-5311

DRAWING TITLE
CERTIFICATION UNIT 95, SUB-UNITS 2 & 3
CU95 ACCESS
REMEDIAL ACTION WORK PLAN
HUDSON RIVER PCBs SUPERFUND SITE

DRAWN BY	CHECKED BY	DRAWING NO.	SCALE
SEK	MG	FIGURE 2-6	1" = 100'
DATE 02/03/2015	APPROVED BY MG		JOB NO.

FILE NAME: C:\USERS\P005684A\DESKTOP\GEHR-RAWP\2015_CU95_RAWP_2-6.DWG
PLOT DATE: 5/18/2015 9:53 AM PLOTTED BY: SMITH, NICOLE

TRANSLOADER DREDGE LOCATED IN DEEPER WATER

EXISTING CRUSHER RUN ENTRANCE ROAD

MATERIAL STORAGE BINS

SILT FENCE

LARGE HOPPER BARGE

RIVER ROAD STAGING AREA

UPM 125+00

MINI HOPPER AND JET BOAT

TRUCK ROUTE AREA TO BE GRADED AS REQUIRED FOR TRUCK TURNAROUND

SPUR FOR WALKING EXCAVATOR ONTO PLATFORM WITH CRANE MATS)

APPROXIMATE MINI HOPPER TRANSIT PATHWAY

WLMD 0+00

LMD 0+00

CU95-2 ACCESS ROAD

LMD 5+00

CU 95-2

LONG REACH DREDGING/ BACKFILL EXCAVATOR (TYP)

FINGER PIERS

SILT CURTAIN

TRANSLOAD EXCAVATOR

WLMD 5+00

LMD 10+00

MINI HOPPER

CU 95-3

LMD 15+00

CONCRETE BLOCK BULKHEAD

DREDGE PLATFORM

SEINE NET

N

LEGEND

- NON-NATIVE PLANT AREA (INVASIVE SPECIES)
- WETLAND AREA DELINEATION
- SUBMERGED/FLOATING AQUATIC VEGETATION DELINEATION
- LIMITS OF ACCESS DREDGING

PARSONS
COMMERCIALTECHNOLOGY GROUP
GE COMPANY - PARSONS PROJECT OFFICE
BUILDING 40-2, 381 BROADWAY
FORT EDWARD, NEW YORK 12828 (518) 746-5311

DRAWING TITLE

CU95-2 AND CU95-3
GENERAL ARRANGEMENT
REMEDIAL ACTION WORK PLAN
HUDSON RIVER PCBs SUPERFUND SITE

DRAWING NO.	SCALE
FIGURE 2-7	1" = 200'
	JOB NO.

SECTION 3

HABITAT CONSTRUCTION

This section describes the habitat construction work to be performed by the Habitat Contractor pursuant to Contract 53A in certain areas dredged in 2014 (and, in one area of CU 99, 2015). Those targeted areas consist of portions of a number of CUs from CU 61 through CU 99 (as well as the finger area of CU 51 that was dredged in 2014), and the work will involve the planting of SAV, RFW, or a combination of both where required by the applicable design specifications. These areas are listed by CU in Table 3-1.

Table 3-1 2015 Habitat Construction Areas

Planting Type	CU
SAV	CUs 63, 82, 85, 91, and 99
RFW	CUs 51 (finger area), 61-63, 64 (portion dredged in 2014), 80-83, 91, 97, and 99 (portions dredged in 2014 and 2015)

3.1 EQUIPMENT STAGING

Vessels used to support habitat operations will be launched at various boat ramp locations along the river, where permission for use has been obtained, in the closest proximity to CUs where planting will occur.

3.2 PRE-PLANTING SURVEY

A pre-planting survey of SAV active, contingent and natural recolonization areas and designated RFW areas will be conducted by GE's third-party surveyor to confirm that the necessary planting elevations are available in SAV planting and RFW areas. The pre-planting survey will occur after the peak spring high flow has occurred. If any active SAV planting areas are shown to no longer have the necessary planting elevations, nearby contingent SAV planting areas with the necessary elevations will be selected to replace the lost active SAV planting areas. Similarly, if designated RFW areas are shown to no longer have the necessary planting elevations, other areas with the necessary elevations will be selected, in consultation with EPA, for construction of the necessary RFW to replace the lost RFW areas. In addition, a reconnaissance of the SAV planting and RFW areas will be conducted by the contractors and the CM to verify that site conditions are satisfactory for installation of plant material prior to planting. The results of the SAV and RFW reconnaissance and the pre-planting survey will be reviewed with EPA prior to implementation of planting. Any observed conditions that have the potential to interfere with planting will be reported to the CM; and if necessary, alternative planting locations or methods will be identified and proposed to EPA.

3.3 TRANSPORT OF PLANTS

Plants will be delivered daily from the off-site nursery to the Alcove Marina (Figure 2-4B), SBLA (Figure 2-4B), or other loading locations, as appropriate. The plants will be transferred by boat to the work area and, for SAV, held on or adjacent to the diving support boat(s) until planted. Any plants not installed on a given day may be returned to the off-site nursery, stored in suitable containers at the planting site, stored in the river in the vicinity of planting, or stored in water tanks on the plant supply vessel.

3.4 SAV PLANTING

The designated SAV planting areas will be planted with SAV plants, including wild celery (*Vallisneria americana*), American pondweed (*Potamogeton nodusus*), and white water lily (*Nymphaea odorata*). Any designated SAV planting area that is scheduled for planting in 2015 but is not planted in 2015 will be planted in 2016. For 2015, it is anticipated that the planting season will extend into early August and will end based on the maturity, condition, and life cycle indicators of the plants. For the 2015 season, 20% of *Vallisneria americana* plant units found to be flowering in delivered 50-plant unit trays will be an indicator that the planting window is ending, unless otherwise approved by EPA.

3.4.1 SAV Plant Sources

The names and locations of the SAV plant sources to be used in 2015 are provided in Table 3-2.

Table 3-2 2015 Sources of SAV Plant Material

Vendor	Location
Vermont Wetland Plant Supply	Orwell, VT
NYSCC Feeder Canal	Glens Falls, NY
Toadflax Nursery	South Glens Falls, NY
Black Bear Nursery	Winburne, PA

Certificates from plant suppliers will be provided to the CM for each species of plant stock at least 10 days prior to planting or as otherwise directed by the CM. Certificates will include the botanical name, common name, origin, age, date of packaging, name and address of supplier, and county and state of origin.

The Habitat Contractor will employ an independent specialist to confirm that the different plant species have been correctly identified. The independent specialist will review plants from any new source and provide a species determination for that source. All plants delivered to the project will be inspected to confirm that they meet the definition of "Acceptable Plant Material"

and the pertinent acceptance criteria specified in Table A2-3 of the 2015 DQAP (Appendix A). Acceptable plant material is defined as follows: "Plants that are free of insects and diseases, appear healthy and exhibit visible signs of viability such as green leaves and stems; plants do not appear chlorotic or exhibit signs of desiccation. Plants that do not exhibit visible signs of herbivory and roots and rhizomes/runners are present." Dormant plants will be required to exhibit healthy roots or rhizomes and/or leaf buds to be acceptable. Acceptable tubers are defined as follows: "Tubers are firm, healthy, and brownish-white in color." Plant inspection activities will continue until plants are provided to the divers engaged in active planting. All plant materials will be visually inspected for the presence of invasive species. Any invasive species identified during the visual inspection will be removed and disposed of.

3.4.2 Planting Unit Configuration

For *Vallisneria americana* and *Potamogeton nodusus*, a planting unit will consist of a minimum of two individual plants or tubers and growing medium contained within a biodegradable pot. Unless otherwise approved by the CM, each individual plant will contain green leaves, roots, and associated rhizomes.

For *Nymphaea odorata*, a planting unit will consist of a one to three inch tuber and growing medium contained within a biodegradable pot unless otherwise approved by the CM. At the time of planting, it is acceptable for a *Nymphaea odorata* planting unit to contain leaves and stems.

The SAV plants will be similar in size to those occurring naturally in the Hudson River at the time of installation. If plant leaves need to be trimmed, they will be trimmed so that at least 5 inches of leaf material are present. Any changes to the planting unit configuration will be provided to EPA for review and approval.

3.4.3 SAV Planting Procedures

The SAV planting will occur in the SAV areas shown on the applicable design drawings for habitat planting and plant supply, which have previously been provided to EPA. (A compilation of the 2015 habitat construction drawings will be provided to EPA.) SAV planting areas are listed by CU in Table 3-1. Prior to the commencement of installation, the Habitat Contractor will visit the planting areas and prepare an appropriate planting plan for each area based on observed local conditions. These planting plans will include delineation of unit configurations along with a proposed planting list should it vary from what is currently identified in the design drawings.

The Dredging Contractor will mobilize a dive crew and a dive pontoon boat to install the aquatic planting units furnished by the Habitat Contractor. The Habitat Contractor will mobilize a plant supply pontoon boat to transport and maintain planting units before they are provided to divers engaged in active planting.

The SAV plantings will meet the acceptance criteria specified in Table A2-3 of the 2015 DQAP (Appendix A) for spacing, density, and configuration. *Vallisneria americana* and *Potamogeton nodosus* planting units will be installed with a spacing of roughly 2 ft between each planting unit. The *Nymphaea odorata* planting units will be planted in clusters of 25 in shallower planting areas (approximately 2 ft to 3 ft water depth near the project shoreline) and will be interspersed between the rows of *Vallisneria americana* and *Potamogeton nodosus*. To assist the divers in maintaining this spacing, poles will be used as reference markers at the corners of the planting limits and at 10-ft intervals along the boundary of the planting limits. The divers will be equipped with a rope marked with tape at 2-ft intervals. The rope will be attached to weights at each end so that the rope can be stretched taut across the limits of the planting area and moved as planting progresses to subsequent rows. The divers will use the marked rope for reference during planting to aid in establishing the spacing of roughly 2 ft between planting units. The outside perimeter of the planting area will be marked using anchored inflatable buoys spaced at approximately 50-ft intervals.

The dive boat is equipped with a GPS unit that allows the boat operator to see where the dive boat is located in relation to the planting area. The dive pontoon boat draws very little water (less than 2 ft), and it is anticipated that it should be possible to move and anchor the boat close to the point of planting. At the end of each work day, the total plantings installed and the approximate area of placement will be recorded. The following day's work will typically start where the preceding day's planting ended.

The diver's dive gear will include a simple wet/dry suit, depending on water temperatures, for water depths less than 3 ft, and a surface-supplied air and communication tether through a dive helmet for water depths greater than 3 ft. The planting units will be delivered each day to appropriate loading location by the Habitat Contractor and loaded onto its plant supply pontoon boat. The plant supply pontoon boat will be located as needed depending on the location of plant placement and depth of water. In addition to the plant supply pontoon boat, a small boat or other floating container may be used to transfer the plantings into the very shallow areas.

Once the diver is aligned within the planting area, the diver will begin installing the plants by removing approximately three to four inches of backfill material with a scooping motion of a cupped hand or trowel. The planting unit will then be placed into the resulting hole. Once the planting unit is placed in the hole, the diver will spread the removed backfill material around the planting unit and pat it down to secure it.

Using the reference stakes as a guide, the diver will install the *Vallisneria americana*, *Potamogeton nodusus*, or *Nymphaea odorata* plants as directed by the Habitat Contractor. To manage spacing of the plantings, the divers will use a rope with markings at every 2 ft and move the rope through the planting area starting from the upstream limit to the downstream limit.

It is anticipated that two or more divers will be actively planting in a planting area. The dive tenders located on the dive pontoon boat and the Habitat Contractor personnel located on the plant supply pontoon boat will work together to furnish the planting units to the divers. The

method of supply will depend on a number of factors and will be adapted as needed in order to supply divers in an efficient manner. Planting units that are waiting to be supplied to the divers will be stored in water.

SAV planting is planned to commence in CU 63 and continue sequentially from north to south. GE will provide EPA with regular updates regarding planting sequence and progress in the different CUs targeted for planting in 2015. To the extent practicable, SAV planting will be coordinated with the RFW planting such that SAV planting will occur in a CU after RFW planting has been completed in that CU. This co-ordination will minimize the potential for vessels associated with RFW planting to disturb freshly planted SAV areas. Areas that are unable to be planted in the 2015 season will be planted in future seasons.

3.4.4 SAV Monitoring, Re-planting, and Acceptance

Following completion of the initial installation of plantings in each SAV planting area, monthly monitoring events will be conducted in each such area until September 15 of the planting year (2015). Monitoring of SAV plantings will start at the upstream part of any given planting area using a shallow draft boat that is positioned via GPS. Using a video camera on a cable or pole, the plants will be viewed along transects to provide a quantitative assessment (upstream, in the middle, and downstream) of the planting sub-area without the use of divers. An additional "floatover" with the video camera will be performed at each SAV planting area to provide a qualitative assessment of that area. Analysis of the video records will be performed, such that the number of missing plants for the entire planting area (or sub-area) will be estimated, an accurate appraisal of percent plants in place is generated, and an overall condition factor for planted vegetation can be generated. The survey will also be used to determine if invasive species have entered the habitat planting area. In addition, video transect monitoring will be conducted in any natural recolonization areas backfilled in 2014, as well as in 2015 SAV planting areas that are backfilled but not planted in 2015, to determine if invasive species have recruited to the areas. Any such invasive species observed will be removed. All video transects will be a maximum of 20 ft apart from one another, and a minimum of three transect surveys will be completed at each natural recolonization and planting sub-area within the CU where the areal extent of the sub-area allows.

In SAV areas where plants are observed to be present at the end of the 2015 monitoring period, habitat construction will be deemed to be complete, and the areas will be considered ready for implementation of operation, maintenance, and monitoring (OM&M) activities under the Phase 2 Habitat Adaptive Management (AM) program. For a CU where the plants installed in accordance with project specifications are observed to be present in SAV areas within the CU (and assuming that all other remedial construction activities, including the initial habitat construction, have been completed), a CU Certification Form 3 will be submitted to EPA for review and approval. For a CU where such plants are observed in only a portion of the SAV areas (and again, assuming that all other remedial construction activities have been completed), a CU Certification Form 3 will be submitted to EPA for review and approval based

on GE's commitment to conduct replanting in the remaining SAV areas in that CU in the spring/early summer of the following year (as described below).

If any SAV areas are observed where plants appear not to have survived at the end of the 2015 monitoring period, those areas will be subject to an inspection at the start of the growing season in 2016; and if the plants are still not observed, those areas will be subject to a one-time re-planting event during the spring/early summer following planting (i.e., in 2016). The replanting will be directed by the CM. Any observed invasive species in the SAV planting areas will be removed by hand during this activity. The re-planting effort, if necessary, will be described in a habitat construction work plan for 2016. This re-planting will constitute the completion of habitat construction in those areas, and the areas will be considered ready for implementation of OM&M activities under the Phase 2 Habitat AM program.

3.5 RFW PLANTING

RFW planting will be conducted in RFW areas constructed during the 2014 dredging season; these areas are listed by CUs in Table 3-1. These areas are to be planted with the relevant wetland plant species, which have been selected according to elevation zones: Zone A – frequently exposed areas; and Zone B – infrequently exposed areas.

3.5.1 RFW Plants and Seeds

Zone A areas will be planted with the following species: blunt spikerush (*Eleocharis obtusa*), fox sedge (*Carex vulpinoides*), soft rush (*Juncus effuses*), soft-stemmed bulrush (*Scirpus validus*), *and* wool grass (*Scirpus cyperinus*). Zone A areas will be seeded with the Zone A Wetland Seed Mix listed on the design drawings. Zone B areas will be planted with the following species: great burreed (*Sparganium eurycarpum*), white water lily (*Nymphaea odorata*), pickerel weed (*Pontederia cordata*), and broad-leaved arrowhead (*Sagittaria latifolia*). Zone B areas will be seeded with wild rice (*Zizania aquatica*) seed. If the Habitat Contractor is unable to source a particular species in the quantity required, substitute species will be proposed to EPA for review and approval.

3.5.2 RFW Plant and Seed Sources

RFW plants and seeds will be obtained from commercial nurseries that are able to provide plants and seeds produced from species native to the Hudson River watershed and sourced from the northeastern United States (covering New England New Jersey, New York, and/or Pennsylvania). The names and locations of the nurseries identified as sources of 2015 RFW plant material are provided in Table 3-3.

Table 3-3 2015 Sources of RFW Plant Material

Vendor	Location
Toadflax Nursery	South Glens Falls, NY
Vermont Wetland Plant Supply	Orwell, VT
Black Bear Nursery	Winburne, PA

Certificates from plant suppliers will be provided to the CM for each species of plant stock at least 10 days prior to planting. Certificates will include the botanical name, common name, origin, age, date of packaging, name and address of supplier, and county and state of origin. GE's vendors will endeavor to obtain all plants and seeds from sources in the northeastern United States. If GE becomes aware that plants or seeds are unavailable in the necessary quantities from sources in the northeastern United States, GE will provide alternate source locations to EPA for review and approval.

The Habitat Contractor will employ an independent specialist to confirm that the different plant species have been correctly identified. The independent specialist will review plants from any new source and provide a species determination for that source.

All plant material delivered to the project will be inspected to confirm that it meets the definition of "Acceptable Plant Material" and the applicable acceptance criteria in Table A2-5 of the 2015 DQAP (Appendix A). Acceptable plant material is defined for RFW stock as follows: "Plants appear healthy and exhibit visible signs of growth; plants do not appear chlorotic or exhibit signs of desiccation. Leaf margins are predominately green with limited areas of spots or blotches." Dormant plants will be required to exhibit healthy roots or rhizomes and/or leaf buds to be acceptable. Acceptable tubers are defined as follows: "Tubers are firm, healthy, and brownish-white in color." In addition, plants will be free of insects and diseases and will not contain weed species. All plant materials will also be visually inspected for the presence of invasive species; and any invasive species identified during the visual inspection will be removed and disposed of. The Habitat Contractor will use its own nursery located in South Glens Falls, NY to receive deliveries from the plant supply vendors. Plants that meet specifications will be transported from the holding nursery to the appropriate planting vessel loading locations (see Figures 2-4B through 2-4D).

3.5.3 RFW Planting and Seeding Procedures

The RFW planting will occur in the RFW areas shown on applicable design drawings for RFW construction, which have previously been provided to EPA. (As noted above, a compilation of the 2015 habitat construction drawings will be provided to EPA.) RFW areas will be approached from the river side by boat. Prior to the commencement of installation, the Habitat Contractor will visit the planting areas and prepare an appropriate planting plan for each area based on observed local conditions. These planting plans will include delineation of Zone

A and Zone B areas along with a proposed planting list should it vary from what is currently identified in the design drawings.

It is anticipated that planting and seeding will occur sequentially from north to south. GE will provide EPA with regular updates regarding planting sequence and progress in the different CUs targeted for planting in 2015. Areas that are unable to be planted or seeded in 2015 will be planted/seeded in future planting years.

Planting

All plants stored in the field during installation will be sheltered from the drying effects of direct sunlight and prevailing winds. To assist the crew in maintaining the preferred spacing and to ensure that the plantings are not over- or under-estimated, the limits of the areas to be planted will be delineated with wooden stake markers. To install the RFW plants, the existing erosion control fabric (placed by others), where present, will be cut or otherwise penetrated at the planting location to allow the plant to be installed. Removal or cutting of the fabric will be limited to that necessary to install the plant.

Zone A plants will be installed by hand through the use of a dibble bar or similar tool to create space in the backfill material for installation of the plant. Once the plants are installed, excavated material will be placed around the plant and tamped into place by hand. Generally, Zone A plants should not require securing outside of planting. Wooden pegs will be gently inserted through the root ball and in the surrounding substrate to help hold the plants in place during high flow events.

In water depths up to 2 ft, Zone B plants will be installed by hand through the use of a hand trowel or dibble bar to create a hole large enough for the plug. These plants will typically be installed below the water level and will likely need to be secured with wooden pegs inserted through the root ball as described above. In the Zone B areas that are in water depths greater than 2 ft, the Habitat Contractor will use a specially designed tool to penetrate the erosion control material then use a pottiputki-type device to create a small hole in the sediment. The pottiputki-type device allows planting units to then be lowered through its tube into the newly created hole. Water lily (*Nymphaea odorata*) will be the primary type of plant that will be installed in deeper RFW areas using this technique. Once installed in the sediment the planter will use their foot or a hand tool to gently tamp around the plant.

The Habitat Contractor will supply and install the RFW plants. The planting crew, consisting of approximately five persons, will transport the plants from the off-site nursery to the site, transfer them onto the plant supply pontoon boat, and then navigate to the RFW planting location, where they will anchor the boat, offload the plants, and commence planting activities.

Following plant installation, the areas will be marked to prevent intrusion by foot traffic and/or equipment. Protection from herbivory will be accomplished with frequent monitoring and installation of predator-control exclusion fencing. The exclusion fencing will allow smaller

animals to pass through freely while limiting access to geese and swans. Fencing will be installed around the perimeter of planting areas requiring protection from herbivores. Exclusion fencing will be visually inspected on daily basis to ensure that it remains in place and to remove any wildlife that may become entangled. All wildlife fencing will be removed upon acceptance of planting areas.

Seeding

Zone A seed will be installed beginning in May 2015 (or as soon thereafter as river flow conditions allow) through the use of a hand-operated broadcast seeder. In areas where standing water is present, seed will be mixed with soil and broadcast by hand to ensure even distribution and to help increase negative buoyancy. Soil selected for this process will be predominantly clay and will be mixed in buckets with equal parts of seed.

Zone B seed (wild rice) will be available in the fall/winter of 2015 and will be transported to the site in sealed bags kept cool by refrigeration. Due to the relatively large size of the wild rice seed, it will be hand-broadcasted. In order to ensure adequate coverage, seed quantities for each identification area will be weighed and measured off site and then bagged separately by CU. The installation procedures of Zone B seeds will depend on the size of the area. Specifically, for seeding areas less than 0.25 acre in size, two applications of 50% each of the pre-weighed seed will be broadcast by hand across the entire site. For larger seeding areas, the prescribed seed allotment will be split into 0.1-acre portions and installed incrementally to ensure even and adequate seed coverage.

Environmental factors such as fluctuating water and air temperatures, high river flows, and high winds could impact seed placement. Specifically, the water temperature recommended for Zone B seed installation is 40 degrees Fahrenheit (F). To ensure that this specification is met, initial seeding will begin after 3 consecutive days of water temperature less than 40 degrees, which is anticipated for early December. Zone A seed will not be installed when air temperatures drop below 35 degrees F or rise above 90 degrees F, or when larger precipitation events are forecast to occur in the next two days. River flows exceeding 10,000 are likely to affect both the seed distribution and the ability for the boat to maintain position. High winds will also affect the boat positioning and control. In addition, the presence of ice in the planting area would prohibit seed from settling to the river bottom. If any of these conditions are evident prior to start of seeding, the activity will be postponed. Seeding will subject to the acceptance criteria listed in Table A2-5 of the 2015 DQAP (Appendix A), which specify limitations based on water temperature, wind velocity, and precipitation for when seeding will be conducted.

3.5.4 RFW Maintenance

Plant maintenance will occur after installation of plant material until September 15 of the planting year or the date of first frost, whichever occurs first. Maintenance activities will include watering of plants if rainfall and river flows do not provide sufficient water to the plants, as well as repairs and adjustments to installed herbivory controls. In addition, the RFW

areas that were backfilled in 2014 and are planted in 2015, as well as RFW areas that are backfilled but not planted in 2015, will be monitored for the presence of non-native species, and any non-native species observed in those areas will be removed. The non-native plants will be removed by hand-pulling or using hand tools so that stems, leaves, and associated roots of the observed non-native plants are removed. All removed plant parts will be placed in black plastic bags and sealed and then disposed of in a proper trash container.

As part of the maintenance activities, to the extent that the required number of plants in a given area is not met, additional plants of similar size and species as specified will be planted, so that the total number of healthy plants at the end of the 2015 planting season matches the required number for a given RFW area. Dormant plants may be installed during the last month of the maintenance period.

3.5.5 RFW Monitoring, Re-planting, and Acceptance

On or about September 15, 2015, monitoring of the planted 2015 RFW areas will be conducted. In planted 2015 RFW areas where plants are observed to be present at the end of the 2015 maintenance period, habitat construction will be deemed to be complete, and the areas will be considered ready for implementation of OM&M activities under the Phase 2 Habitat AM program. For a CU where the plants installed in accordance with project specifications are observed to be present in RFW areas within the CU (and assuming that all other remedial construction activities, including the initial habitat construction, have been completed), a CU Certification Form 3 will be submitted to EPA for review and approval. For a CU where such plants are observed in only a portion of the RFW area, the area where plants were not observed will be replanted with dormant plants, and (again, assuming that all other remedial construction activities have been completed) a CU Certification Form 3 will be submitted to EPA for review and approval.

3.6 ANCHORING

All access to the project site and work areas will be from the water. The habitat construction support vessels will not use spuds or anchors that would be large or heavy enough to penetrate backfill into any underlying cap areas.

3.7 DEMOBILIZATION

Once all planting is complete, habitat construction support vessels will be removed from the site. In addition, after the 2015 maintenance and monitoring activities are complete, the wooden stake reference markers installed along the planting area limits (as described above) will be removed as will herbivory controls. No other on-site demobilization activities will be necessary.

SECTION 4

CONSTRUCTION SCHEDULE

4.1 OVERVIEW

The construction schedule for 2015 D&FO is presented as Figure 4-1. This schedule identifies the major construction and operational activities, sequence of dredging operations, processing facility operations, and rail yard operations (including the loading and off-site shipments of processed material) required to complete the 2015 D&FO.

The construction schedule describes the anticipated reasonable durations for the 2015 D&FO activities. The schedule accounts for seasonal limitations for construction in the Upper Hudson Work Area (e.g., ice formation, safe working conditions such as water temperatures and flow conditions).

In addition, the dredge production schedule is presented in Table 4-1 (discussed in Section 4.3 below), based on the expectation that the 2015 season will represent the final year of Phase 2 dredging, as discussed in the 2015 PSCP. This production schedule identifies the *in situ* volumes of dredged material targeted for removal during each month of the 2015 dredging season.

4.2 INTERFACE POINTS WITH OTHER CONSTRUCTION ACTIVITIES

As described in Section 1.2, the 2015 D&FO will be performed under four major contracts: Processing Facility Operations (Contract 30), Dredging Operations (Contract 42A), Habitat Planting and Plant Supply (Contract 53A), and Rail Yard Operations (Contract 60). The interface points between these contractors are listed below.

The key interface points between the Dredging Contractor (Contract 42A) and the PFOC (Contract 30) are as follows:

- The Dredging Contractor will load sediment barges with sediment and debris, and then transport the sediment barges to the unloading wharf. The Dredging Contractor will provide the PFOC with advance notice prior to delivering a barge of sediment or debris to the unloading facility.
- The Dredging Contractor will either hold the barge to be unloaded against one of the unloading wharfs so that the PFOC can attach it to the barge breasting system or, if the barge breasting system is in use, will tie up the barge to be unloaded to the fendering to the north or the south of the unloading wharf, and will transfer the barge trip log to the PFOC. If all mooring locations at the unloading wharf are used, the Dredging Contractor will temporarily anchor the barge elsewhere until a mooring location becomes available. Double-breasting of barges at the unloading wharf is not permitted without approval from NYSCC.

- The PFOC will then unload the barge and return it to the Dredging Contractor. The PFOC will provide advance notice to the Dredging Contractor that the barge has been unloaded and is available for loading.
- The PFOC and the Dredging Contractor will provide to each other a single point of contact that is accessible 24 hours a day during operations to allow coordination of activities.

The key interface points between the PFOC (Contract 30) and the RYOC (Contract 60) are as follows:

- The PFOC will transfer the processed sediments, including the processed fine material (filter cake) and separated coarse material, as well as any debris, to the material staging areas. The PFOC will then remove those materials from the staging areas, load them into rail cars fitted with containers (waste enveloping liners), and close the rail car containers prior to shipment. The PFOC will also be responsible for placing and closing the rail car containers.
- The RYOC will place rail cars for loading and move the rail cars after they are loaded. These activities will be closely coordinated with the PFOC.

4.3 DREDGING PRODUCTION SCHEDULE

The dredging production schedule identifying the *in situ* volumes of material targeted for removal for each 4-week period of the 2015 dredging season (including dredging in CU 60 and in the Landlocked Area) is presented in Table 4-1. The volumes listed in this table are based on the initial dredge prisms issued to the Dredging Contractor for the areas that are currently anticipated to be dredged. The volumes in the table include volumes associated with proposed access dredge areas, but do not include volumes associated with any additional dredging passes needed to achieve the requirements of the Residuals Standard or with additional access dredging should river flows be abnormally low during 2015. The additional dredging pass volumes are unknown at this time but will be included in the volumes to be reported in the weekly, monthly, and annual productivity reports for the 2015 dredging operations. Note that, the volumes in the table represent an estimate of the dredged material targeted for removal in each 4-week period; the actual amount removed may be more or less depending on field conditions.

Table 4-1 *In situ* Volume of Sediment Targeted for Removal (cy)

4-Week Period	*In situ* Volume of Material Targeted for Removal (cy)
1: Weeks 1 – 4	52,700
2: Weeks 5 – 8	52,200
3: Weeks 9 – 12	24,300
4: Weeks 13 – 16	10,200
5: Weeks 17 – 20	39,800
6: Weeks 21 -22	8,800
Total	188,000

4.4 ASSUMPTIONS AND QUALIFICATIONS

The construction schedule and dredging production schedule shown in Figure 4-1 and Table 4-1 are based on the following assumptions and qualifications:

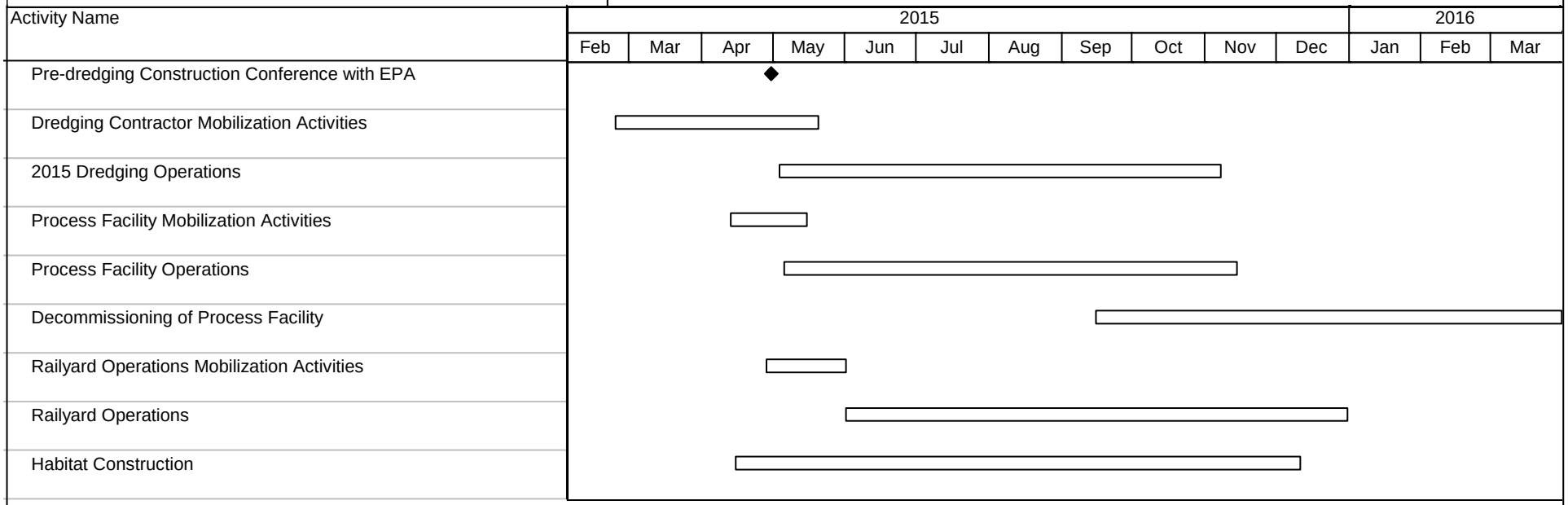
- Third-party entities, including, but not limited, to utility service providers, rail carriers, and disposal facilities, honor existing contracts.
- Start-up and testing of the sediment processing facility are successfully completed by May 1, 2015.
- EPA approves the final 2015 RAWP, including appendices, as well as the final CU 60 RAWP (Parsons 2015a), in sufficient time to allow commencement of the 2015 D&FO on the planned schedule.
- Proposed work hours are unchanged.
- Proposed equipment type and quantity are unchanged.
- NYSCC opens Champlain Canal system for commercial navigation on or shortly after May 1, 2015, and the Champlain Canal system remains open and available for use of commercial vessels until November 15, 2015.
- NYSCC operates locks on a 24-hour per day basis at the NYSCC locks needed for 2015 D&FO.
- Weather conditions meet average seasonal limitations for construction in the Upper Hudson River work area (e.g., frost conditions, high water events, ambient temperature limitations).
- Necessary property access can be obtained to conduct 2015 D&FO.

- Actual site conditions are consistent with site condition data that have been previously obtained and relied upon for the basis of design and construction.
- Sufficient natural run-of-bank material is available at the approved source(s) to satisfy backfill requirements.
- The distribution of backfill and cap material placed within a given CU is consistent with the overall distribution of backfill and cap material described in the applicable design submittal.
- The amount and location of in-river debris encountered during dredging operations are limited to the debris identified from data that have been previously obtained and relied upon for the basis of design and construction.
- River flows are greater than 10,000 cfs for no more than the seasonal average.
- EPA approves CU Dredging Completion Form and CU Backfill/Engineered Cap Completion Form (Forms 1 and 2) within a reasonable time from the receipt of the applicable forms from GE.
- Multi-beam bathymetric surveys and confirmatory sediment sampling in a completed CU take no longer than 6 days.
- No potentially significant archaeological resources or human remains are discovered during the course of the 2015 D&FO.
- EPA representatives are available on a sufficient basis for timely review, coordination, and approval.
- Recreational vessel traffic is consistent with or less than historical seasonal averages.
- The necessary satellite and wireless communication signals are available with the required strength, consistency and reliability to provide the positioning and communication systems necessary to perform the 2015 D&FO work.
- Spare parts on hand are based on manufacturer's recommendations and are sufficient to maintain operations.
- No delays are incurred due to visual plumes during the placement of the backfill materials with the required fines content.
- Backfill and cap placement ends sufficiently in advance of the closing of the Champlain Canal system to permit demobilization of equipment through that system.
- All necessary backfill materials in habitat construction areas have been placed and approved by EPA by the completion of the 2015 dredging season.
- Rail carriers and disposal facilities are able to handle the transport and disposal of the volume of processed sediments as anticipated.
- The presence of eagles or eagle nests does not disrupt the sequence or the ability to perform the 2015 D&FO work.
- The schedule does not account for events that are beyond the control of GE.

- Material and equipment fabrication and delivery times are estimated; actual fabrication and delivery times are controlled by market conditions and will be determined at the time orders are placed.

2015 Remedial Action Work Plan

FIGURE 4.1 DREDGING AND FACILITY OPERATIONS CONSTRUCTION SCHEDULE



Planned Activities

Milestone

SECTION 5

COMPLIANCE MONITORING

This section provides a very brief overview of the monitoring activities that GE will conduct during the 2015 D&FO to assess achievement of the Phase 2 EPS (USEPA, 2010a), Phase 2 QoLPS (USEPA, 2004, 2010b), and Phase 2 WQ Requirements (USEPA, 2005, 2006, as modified by the Phase 2 EPS and revised SOW attachments). A detailed description of these performance standards and requirements, the specific requirements for this monitoring, and the monitoring programs that GE will conduct during 2015 to meet the requirements of the EPS, QoLPS, and WQ Requirements is provided in the Phase 2 RAM QAPP.

5.1 EPS COMPLIANCE MONITORING

The EPS consist of three performance standards:

1. Resuspension Performance Standard;
2. Residuals Performance Standard; and
3. Productivity Performance Standard.

Under each of these standards, GE will conduct extensive monitoring during the 2015 D&FO, as summarized below.

Resuspension Performance Standard

GE will conduct routine resuspension monitoring during dredging and associated operations that have the potential for resuspending a significant amount of sediment. Monitoring will be conducted at near-field buoy transects, located upstream and downstream of the dredging activities; and the samples will be analyzed for PCBs, total suspended solids (TSS), as well as a number of general water quality parameters such as pH, dissolved oxygen, temperature, and conductivity. Monitoring will also be conducted at far-field stations, located more than one mile downstream of dredging activities, with analyses for PCBs, TSS, and other general water quality parameters. The resulting data will be compared against various criteria set forth in the Resuspension Performance Standard to assess the need for response actions, as described in the PSCP.

Residuals Performance Standard

GE will conduct sampling of the sediments in dredged areas and certain backfilled/capped areas. Cores of sediment will be collected once target design or re-dredge sediment removal elevations have been achieved. The samples will be analyzed and the results will dictate the appropriate response actions to be undertaken, as described in the PSCP.

Productivity Performance Standard

GE will conduct monitoring of productivity during the 2015 D&FO. The monitoring will consist of tracking the dredging productivity – including volumes of *in situ* sediments removed, total tonnage processed, and total tonnage transported off-site for disposal – on a 4-week and cumulative basis. This information will be compared to the scheduled production shown in Table 4-1 to determine whether the estimated volume of sediment to be dredged in 2015 may be increased or decreased.

5.2 QOLPS COMPLIANCE MONITORING

The QoLPS include five performance standards:

1. Air Quality Performance Standard;
2. Odor Performance Standard;
3. Noise Performance Standard;
4. Lighting Performance Standard; and
5. Navigation Performance Standard.

Each of these standards will also require monitoring, as summarized below.

5.2.1 Air Quality Monitoring

GE will conduct routine air quality monitoring for PCBs in ambient air. GE will sample the air continuously (24 hours each day that operations are taking place near the given station) at stations at the sediment processing facility and unloading area, at a permanent background station, and at stations within the dredging corridor, with PCB analysis of 24-hour average samples. The results will be compared with criteria in the Air Quality Performance Standard, although only exceedances of the air quality standards (not exceedances of an air quality concern level) will be reported, as discussed in the PSCP. In addition, GE will conduct monitoring for opacity in response to observations or a complaint indicating a potential opacity issue.

5.2.2 Odor Monitoring

GE will perform odor sampling if on-site workers detect an uncomfortable project-related odor or if an odor complaint is received from the public in the vicinity of the remediation zone. If the odor is identified as potentially hydrogen sulfide (H_2S), monitoring for H_2S will be performed upwind and downwind of the suspected source.

5.2.3 Noise Monitoring

The D&FO contractors will conduct noise monitoring at the initial start-up of any operation or equipment that is different from that used previously in this project. This monitoring will not be considered monitoring for compliance with the Noise Performance Standard; however, if that monitoring indicates a sound level above the criteria in the Noise Standard, additional monitoring will be conducted closer to receptors to evaluate attainment of those criteria. In

addition, GE will conduct noise monitoring at the processing facility and within the dredging corridor whenever a complaint from the public is received. These noise measurements will be compared with the criteria in EPA's Noise Performance Standard to determine the need for additional monitoring or further noise mitigation measures.

5.2.4 Lighting Monitoring

The D&FO contractors will conduct light monitoring at the initial start-up of any operation or equipment that is different from that used previously in this project. This monitoring will not be considered monitoring for compliance with the Lighting Performance Standard; however, if that monitoring indicates a light level above a lighting standard, additional monitoring will be conducted closer to receptors to evaluate attainment of those standards. In addition, GE will conduct light monitoring at the processing facility and within the dredging corridor whenever a complaint from the public is received. These light measurements will be compared with the criteria in EPA's Lighting Performance Standard to determine the need for additional monitoring or further lighting mitigation measures.

5.2.5 Navigation Monitoring

GE will conduct routine monitoring of marine traffic after dredging operations begin. This routine monitoring will involve the recording in daily logs of information about river navigation activities in the vicinity of in-river project operations. GE will also monitor marine traffic within the 2015 project area during mobilization and demobilization activities. The information from these monitoring activities will be used to assess the need for any changes in project-related navigation.

5.3 WQ REQUIREMENTS COMPLIANCE MONITORING

The substantive WQ Requirements were issued by EPA after consultation with New York State Department of Environmental Conservation (NYSDEC). They consist of: (1) requirements relating to in-river releases of constituents not subject to the EPS; (2) requirements relating to discharges of treated water from sediment processing operations, as well as treated storm water from areas within the processing facility where PCB-containing sediments will be managed, to the Champlain Canal; and (3) requirements relating to discharges of non-contact storm water, during overflow of the sedimentation basins at the processing facility, to Bond Creek.

For the in-river releases of constituents not subject to the EPS, GE will conduct routine sampling for certain general water quality parameters at the near-field station. In addition, monitoring for metals will be conducted at any time during the season if there are indications of impacts from the dredging operations, such as fish kills.

For the discharges to the Champlain Canal and Bond Creek, GE will perform regular monitoring of those discharges for comparison with effluent limits established by EPA after consultation with NYSDEC.

SECTION 6

HEALTH, SAFETY, AND ENVIRONMENTAL PROTECTION MEASURES

6.1 D&FO HEALTH AND SAFETY POLICY, PROGRAM AND PLAN

6.1.1 GE Environmental Health and Safety Policy

GE provides a safe and healthy working environment in all the communities in which it does business. GE's environmental health and safety (EHS) programs combine clear leadership by management; the participation of all employees, contractors, and functions; and the use of appropriate technology to confirm the health and safety of its employees and the public.

GE requires that each of its facilities and sites identify and control potential hazards in order to protect the public, its employees, and the environment. Reviews are conducted regularly; deficiencies, if any, are identified; issues are tracked to closure; improvements are made to prevent potential hazards; and mitigation measures are implemented as a result of these reviews. The end result enhances injury prevention, increases operations knowledge, improves communications, and helps ensure compliance with required EHS standards.

The 2015 D&FO will abide by the requirements of GE's world-class EHS program.

6.1.2 CM Health and Safety Program

The CM also holds the highest standards for project health and safety. The safety goal for this project is zero incidents, zero injuries – a Zero Incident philosophy. This approach originated with a study by the Construction Industry Institute, which identified specific control measures shown to dramatically reduce the probability of incidents. These control measures, known as Zero Incident Techniques, provide the framework for safety on this project, and the project team's proactive approach to managing the interrelated areas of safety, health, environment, and risk management. The definition of an incident is any unplanned or unexpected event that results in a personal injury, property damage, or an environmental release.

6.1.3 Health and Safety Plans

6.1.3.1 Remedial Action Health and Safety Plan for 2014

The *Phase 2 Remedial Action Health and Safety Plan for 2015* (2015 RA HASP; Parsons, 2015c) defines minimum safety and health requirements, guidelines, and practices applicable to the overall project. This 2015 RA HASP constitutes an update of the prior RA HASP. For complete details on the project health and safety program, please refer to the 2015 RA HASP.

The 2015 RA HASP reflects the corporate policy of both GE and the CM. The 2015 RA HASP uses the Zero Incident management approach and defines the safety goal for this project as zero incidents and zero injuries.

The 2015 RA HASP provides a general description of field activities. Specific field activities are described in more detail in the Contractors' HASPs. The objectives of the 2015 RA HASP are to:

- Establish minimum health and safety requirements;
- Identify the physical, chemical, and biological hazards potentially present during field work associated with the 2015 RAWP;
- Prescribe the protective measures necessary to control those hazards;
- Define emergency procedures; and
- Prescribe training and medical qualification criteria for site personnel.

The 2015 RA HASP will be reviewed by all contractors and subcontract managers, supervisors, foremen, and safety personnel. All craft personnel performing field activities will receive a site-specific project orientation summarizing the content of the 2015 RA HASP.

The 2015 RA HASP was written to comply with the requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120).

6.1.3.2 Contractors' Health and Safety Plans

Each contractor is required to prepare a Contractor HASP for review and approval by the CM. Each contractor's HASP will discuss tasks and provide detailed procedures and activity hazard analyses specific to its scope of work.

The Contractor HASPs will conform to the 2015 RA HASP and will be reviewed by the CM.

6.1.4 Designated Site Work Zones

To promote the protection of worker health and safety and prevent the off-site migration of PCB-containing materials, the sediment processing facility contains specified work zones, consisting of an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. These zones are described in Section 5.1 of the 2013 Facility O&M Plan, incorporated by reference in the 2015 Facility O&M Plan (Appendix B).

In accordance with the 2015 RA HASP, Dredging Contractor vessels that handle or contain PCB-contaminated material will also contain specified work zones. These zones are as follows:

- The Exclusion Zone is a segregated area of all dredge platforms and sediment barges that dredge or carry PCB-contaminated material. The Exclusion Zone is the portion of the vessel that may come into contact with PCB-contaminated material. Within the Exclusion Zone, all personnel will wear appropriate personal protective equipment (PPE), and personnel and equipment will be decontaminated before moving out of the Exclusion Zone.

- The Contamination Reduction Zone (CRZ) is the transition area from the Exclusion Zone to non-contaminated areas. CRZs will be located on all dredge platforms. The CRZ will be physically sectioned off from the Exclusion Zone and from non-contaminated areas, and is the area where decontamination of personnel will take place.
- The Support Zone is the clean area of all dredge platforms. Crew boats and supply boats dropping off or picking up personnel and supplies will dock at that portion of the dredge platform.

6.1.5 Personnel Decontamination

Decontamination of PFOC and RYOC personnel at the sediment processing facility are described in Section 9 of the 2015 RA HASP and Section 5.2.1 of the 2013 Facility O&M Plan, incorporated by reference in the 2015 Facility O&M Plan.

Dredging Contractor personnel that enter Exclusion Zones or have come into contact with possible PCB-containing sediment will follow the personnel decontamination procedures detailed in Section 9.2 of the 2015 RA HASP. Decontamination will occur within the designated CRZ on board the Dredging Contractor's dredges that handle PCB-contaminated materials.

Disposable PPE will be placed into containers that will be placed on sediment barges or tugs that are being transported to the unloading wharf where the PFOC will place the disposable PPE in railcars for off-site disposal in accordance with the 2013 TDP (see Section 1.3 above). Decontamination water (not containing surfactants or solvents) used in the CRZ will be placed into the sediment barge hopper with the dredged sediment.

Habitat Contractor personnel will not be expected to come into contact with PCB-contaminated materials, and thus no decontamination procedures for Habitat Contractor personnel will be necessary.

6.2 SPILL PREVENTION AND STORMWATER POLLUTION PREVENTION AND RESPONSE

Pollution prevention measures at the sediment processing facility, including spill prevention and storm water pollution prevention measures, are described in Section 5.3 of the 2013 Facility O&M Plan, incorporated by reference in the 2015 Facility O&M Plan. Section 8 of the 2013 TDP also describes spill prevention and storm water pollution prevention measures at the sediment processing facility, including the rail yard. Spill reporting and response actions during in-river operations, at the various support properties, and at the sediment processing facility are detailed in Section 7 of the 2015 CHASP (Appendix F).

6.3 EMERGENCY CONTACT NUMBERS

Emergency contact information and procedures are presented in Section 10 of the 2015 RA HASP and are also included in the 2015 CHASP.

6.4 MONITORING

GE will separately contract for monitoring of the parameters addressed by the Phase 2 EPS, QoLPS, and WQ Requirements, including the water column, airborne PCBs, and (when necessary) opacity, odors, noise, and light, to assess achievement of the criteria set forth in those standards and WQ Requirements. This monitoring was summarized in Section 6 above. Methods for such monitoring are described in detail in the Phase 2 RAM QAPP, and the actions to be taken in the event of an exceedance of such criteria, or in response to complaints about these parameters, are described in the PSCP.

In addition, in accordance with the project technical specifications, the Dredging Contractor, PFOC, RYOC, and Habitat Contractor will conduct monitoring within their work areas for noise and light (if applicable). This work area monitoring will be conducted solely for operations management purposes – to verify compliance with contract specifications and to provide a guide to the contractors of the potential for noise or light levels to exceed the applicable QoLPS criteria at nearby receptors. In addition, the Dredging Contractor will conduct monitoring of certain water quality parameters to verify compliance with contract specifications. Based on the work area monitoring results, the contractors can implement controls strategies as appropriate. This work area monitoring should not be considered as monitoring to assess or verify achievement of the EPS, QoLPS, or WQ Requirements.

SECTION 7

REPORT ON 2015 ACTIVITIES

In accordance with Section 5.5 of the revised SOW, within 30 days of the end of work activities for the 2015 season – i.e., 30 days after completion of dredging, backfilling, capping, shoreline reconstruction/stabilization, and shipment of all processed sediment for that season – GE will submit to EPA an annual report on those activities. That report will include the information specified for that report in Section 5.4 of the PSCP. It will also include record drawings and a certification that the 2015 DQAP was followed.

In addition, the work conducted in 2015 will be included in the final Remedial Action Report to be submitted at the conclusion of Phase 2 in accordance with Paragraph 57.b of the CD.

SECTION 8

REFERENCES

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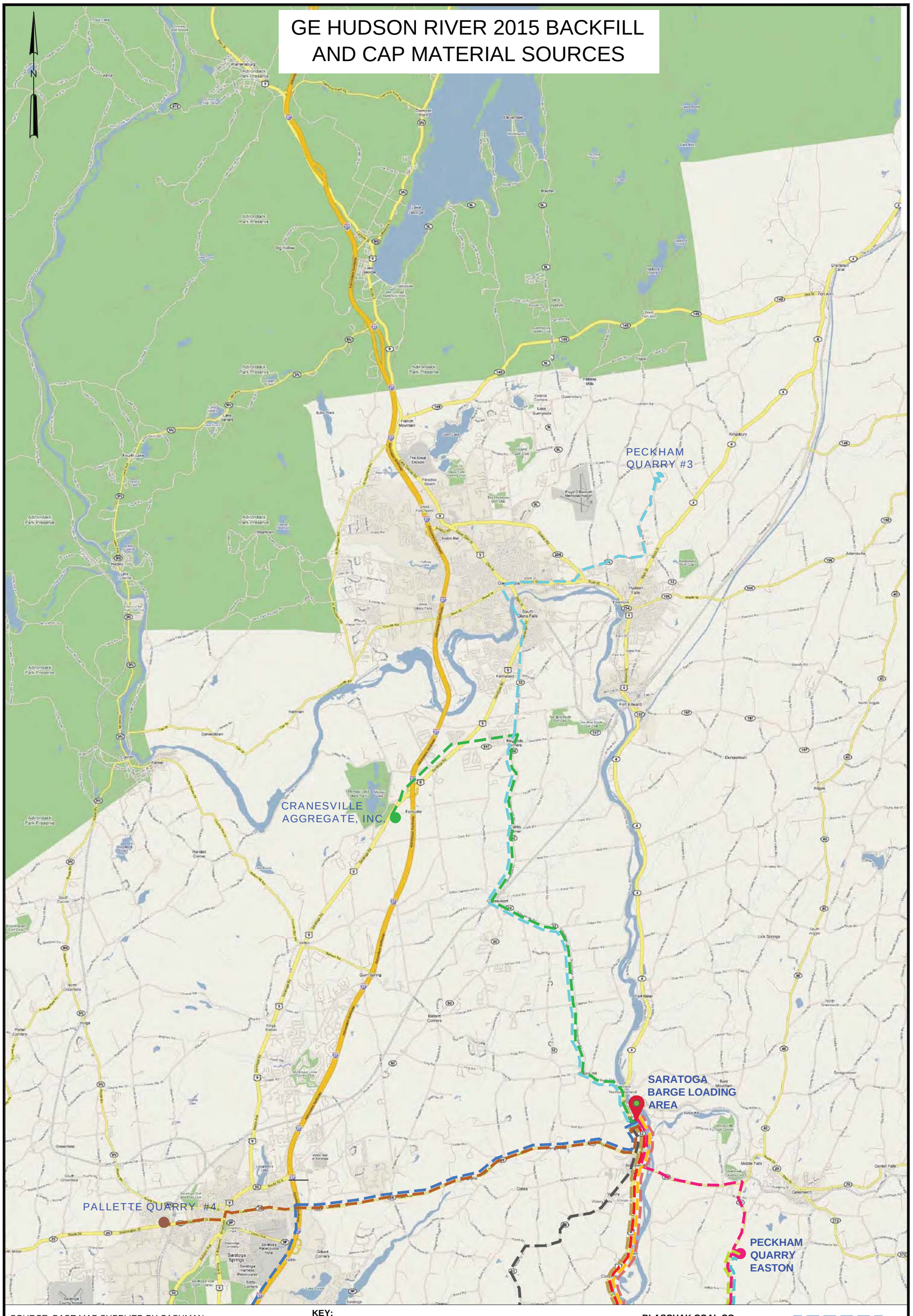
ATTACHMENT 1

MATERIAL SOURCE TRUCK ROUTES

GE HUDSON RIVER 2015 BACKFILL AND CAP MATERIAL SOURCES



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- PALLETTE QUARRY #4
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- LUCARELLI PIT (ALTERNATE ROUTE)
- BRICKYARD PIT
- CRANESVILLE AGGREGATE, INC.
- TROY TOPSOIL
- WEST SAND LAKE QUARRY
- HEMSTREET PARK PIT
- BLASCHAK COAL CO.
- READING ANTHRACITE CO.
- PECKHAM QUARRY EASTON
- PECKHAM QUARRY EASTON - CLEMENTE LATHAM
- WARD PIT - CLEMENTE LATHAM
- TROY TOPSOIL - MOREAU
- BARGE LOADING AREAS
- GRAVEL PIT

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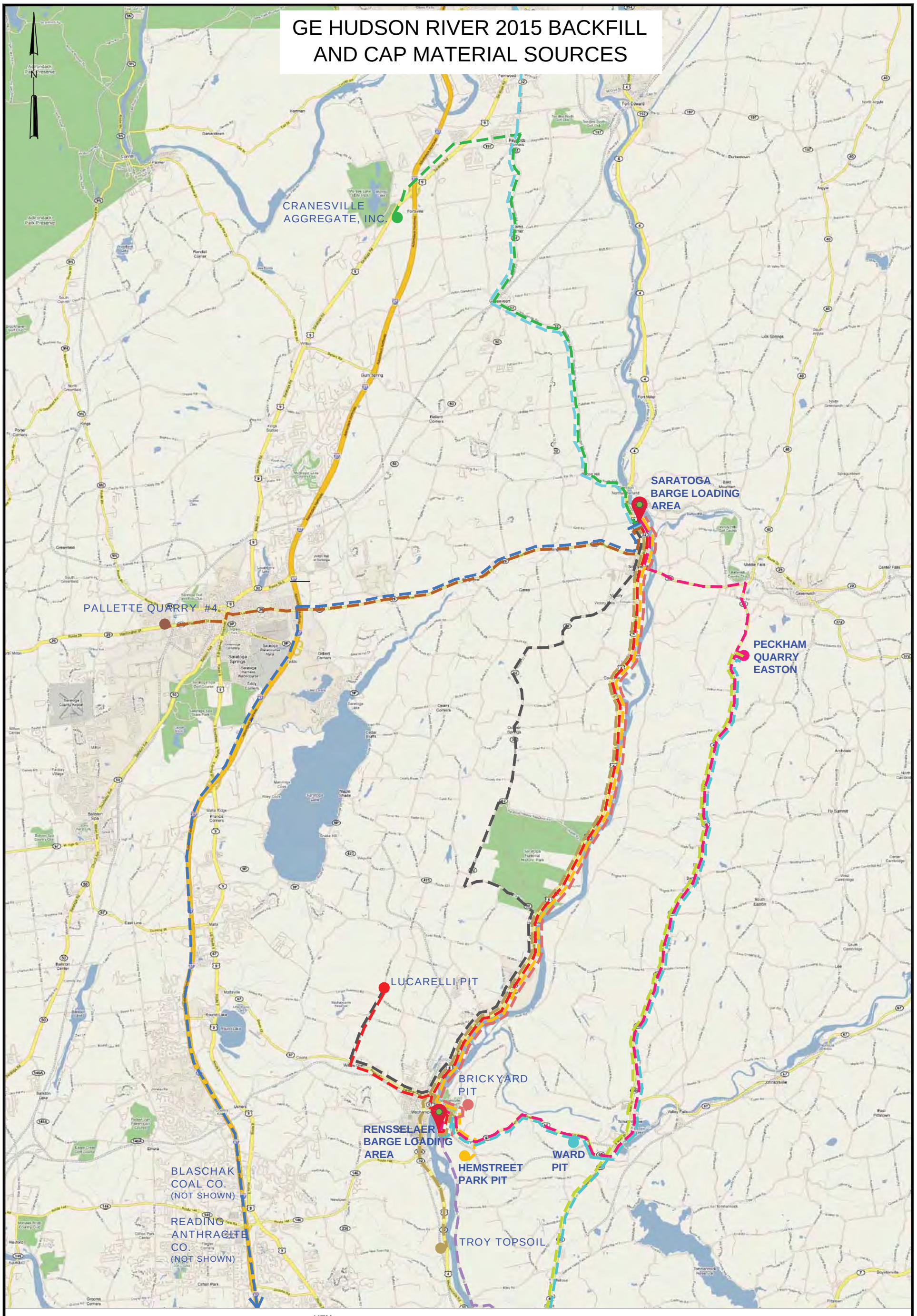

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- BARGE LOADING AREAS
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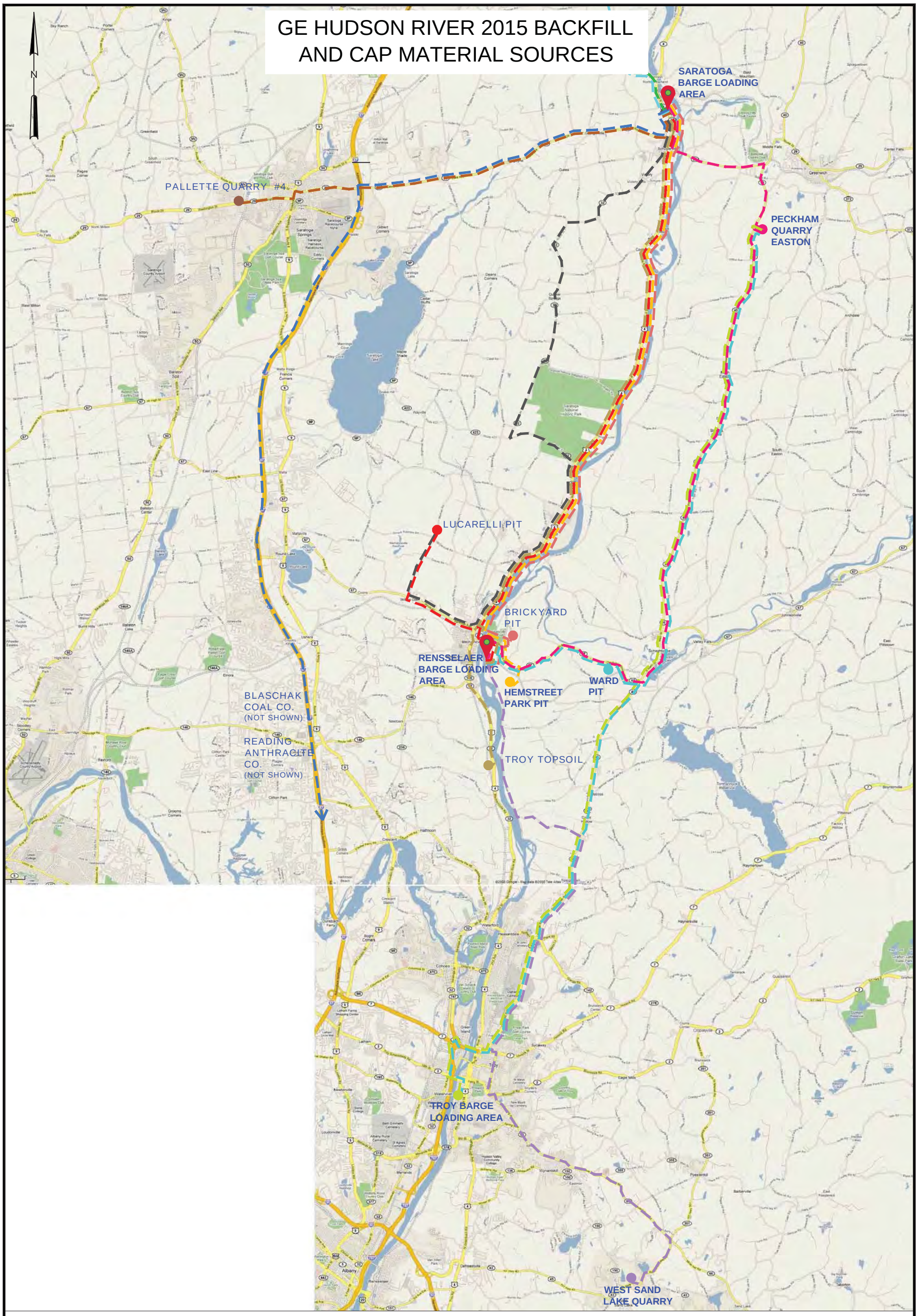
GE HUDSON RIVER 2015 BACKFILL AND CAP MATERIAL SOURCES



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ATTACHMENT 2

MATERIAL SOURCE TRUCK ROUTES FOR CU 95-2 AND 95-3

MATERIAL SOURCE TRUCK ROUTES FOR CU 95-2 AND CU 95-3

N

PECKHAM QUARRY EASTON

LUCARELLI PIT

BRICKYARD PIT

CU-95 SUPPORT PROPERTY

WARD PIT

TROY SAND AND GRAVEL

TROY TOPSOIL

TROY SAND AND GRAVEL

SOURCE: BASE MAP SUPPLIED BY CASHMAN

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ATTACHMENT 3

CONSERVATION MEASURES PLAN FOR EAGLE NESTS PLAN

REDACTED