WORK PLAN

ADDENDUM TO SURFACE SEDIMENT SAMPLING WORK PLAN FOR 2016 HUDSON RIVER PCBs SUPERFUND SITE

Prepared for

General Electric Company

Albany, New York

Prepared by

Anchor QEA, LLC

290 Elwood Davis Road, Suite 340

Liverpool, New York 13088

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LIST OF ABBREVIATIONS

2016 Work Plan	*Surface Sediment Sampling Work Plan for 2016*
DSR	Data Summary Report
EPA	U.S. Environmental Protection Agency
GE	General Electric Company
mg/kg	milligram per kilogram
OM&M	operation, maintenance, and monitoring
PCB	polychlorinated biphenyl
PE	Performance Evaluation
Phase 2 OMM Scope	*Operation, Maintenance, and Monitoring Scope for Phase 2 of the Remedial Action*
Phase 2 RAM QAPP	*Phase 2 Remedial Action Monitoring Quality Assurance Project Plan*
QA/QC	quality assurance/quality control
RA	Remedial Action
RS	River Section
Site	Hudson River PCBs Superfund Site
SOP	standard operating procedure
SOW	*Statement of Work for Remedial Action and Operation, Maintenance, and Monitoring*
TOC	total organic carbon
WFS OMM Plan	*Long-Term Operation, Maintenance, and Monitoring Plan for Water, Fish, and Sediment Monitoring*

1 INTRODUCTION

The revised *Statement of Work for Remedial Action and Operation, Maintenance, and Monitoring* (SOW; EPA 2010a), which was issued by the U.S. Environmental Protection Agency (EPA) in 2010 under the Consent Decree for the Hudson River PCBs Superfund Site (Site), requires the General Electric Company (GE) to conduct a long-term operation, maintenance, and monitoring (OM&M) program following the completion of the Remedial Action (RA) at the Site, which involved dredging of sediments in the Upper Hudson River. The overall scope of the OM&M program was set forth in the *Operation, Maintenance, and Monitoring Scope for Phase 2 of the Remedial Action* (Phase 2 OMM Scope; EPA 2010b), which is Attachment E to the SOW. The required post-remediation OM&M activities described in the Phase 2 OMM Scope include long-term water column, fish, and sediment monitoring to assess long-term recovery. The OM&M activities also include monitoring of the sediment caps and stabilization measures installed in certain dredge areas and the habitat replacement/reconstruction implemented in various areas of the Upper Hudson River. The OM&M activities for the caps, stabilization measures, and constructed habitats are described in separate OM&M plans that have been submitted to EPA on an annual basis during the RA. The long-term water column, fish, and sediment monitoring activities to be conducted as part of the OM&M program will be described in *a Long-Term Operation, Maintenance, and Monitoring Plan for Water, Fish, and Sediment Monitoring* (WFS OMM Plan), which is anticipated to be submitted to EPA later in 2017 or in early 2018.

In the meantime, at EPA's request, GE agreed to conduct the first year of one component of the required OM&M sediment sampling program in 2016 and 2017. As provided in the Phase 2 OMM Scope, the OM&M sediment sampling program involves the collection and analysis of surface sediment samples in non-dredge areas and dredge areas in the Upper Hudson River. The Phase 2 OMM Scope also requires the performance of bathymetric surveys in "Select Areas" that exceeded the sediment removal criteria but were not targeted for removal because they were buried by cleaner sediments. As discussed with EPA, GE conducted the first year of the required surface sediment sampling in non-dredge areas in the fall of 2016, in accordance with the *Surface Sediment Sampling Work Plan for 2016* (2016 Work Plan; Anchor QEA 2016). The results of this sampling were presented in *the 2016 Surface Sediment Sampling Data Summary Report* (Anchor QEA 2017).

This Addendum to the 2016 Work Plan describes the approach for conducting the first year of the surface sediment sampling inside dredge areas, which will be performed in the fall of 2017. It also describes certain additional sediment sampling in non-dredge areas to be completed in River Section (RS) 3 following a data sufficiency analysis conducted by EPA.

The remainder of the long-term water, fish, and sediment OM&M program will be described in the WFS OMM Plan. Those activities will include water and fish monitoring, the other sediment-related monitoring (i.e., the bathymetric survey of Select Areas), and the future rounds of sediment sampling in non-dredge and dredge areas.

2 SAMPLING AND ANALYSIS PROCEDURES

Sampling and analysis procedures will be consistent with those described in the 2016 Work Plan, except as noted below.

2.1 Sampling Locations

2.1.1 Dredge Areas

As described in the 2016 Work Plan, EPA specified the collection of 149 samples inside dredge areas, divided among the three river sections. These samples will be collected in the fall of 2017. The target number of samples inside dredge areas in each river section is shown in Table A-1. The primary target sample locations are shown on Figures A-1a through A-1ad, and their coordinates are provided in Table A-2. Backup locations were also provided by EPA in the event that samples cannot be collected at the primary locations. Those backup locations are also shown on Figures A-1a through A-1ad, and their coordinates are provided in Table A-3. (Note that EPA location ICU-B064 was located outside of any dredge area and therefore is not included in the figures or Table A-3.)

2.1.2 Non-Dredge Areas

As described in Attachment A to the 2016 Work Plan, EPA performed a statistical analysis to identify target sediment sampling locations, and GE sampled the identified target locations in non-dredge areas during the surface sediment sampling conducted in the fall of 2016. In 2017, EPA updated this analysis for locations outside of dredge areas, taking the results of the 2016 surface sediment sampling into consideration. Based on information provided by EPA, EPA determined in that updated analysis that the data collected in RS 1 and RS 2 during 2016 are sufficient to meet the data quality objectives presented in Section 2.2 of the 2016 Work Plan, but that an additional 100 surface sediment samples are required in non-dredge areas in RS 3. These additional samples will be collected in the fall of 2017. Similar to the locations inside dredge areas, EPA provided a set of primary and backup coordinates for each such additional location in RS 3. These locations are shown on Figures A-1a through A-1ad. Coordinates for the primary and backup locations are provided in Tables A-4 and A-5, respectively.

2.2 Sampling Methods

Sampling methods will be consistent with those followed in 2016, with one refinement to the processing procedures for samples containing materials larger than 1 inch. In 2016, the field crew visually gauged material greater than 1 inch, which was then removed prior to placing the sample into laboratory containers. The standard operating procedure (SOP) for 2017 has been updated to incorporate the use a 1-inch sieve to screen out the larger material. The updated SOP is included as Attachment A.

When navigating to target locations in dredge and non-dredge areas, sampling personnel will follow the same procedure utilized in 2016. This procedure includes collecting samples within 10 feet of the target coordinates, to the extent practicable. However, at locations near (i.e., within 25 feet of) dredge area boundaries, to ensure that the sample is collected in the designated "strata" (i.e., backfill/cap material versus non-dredged sediment), the field team may select a location that is farther inside or outside the dredge area boundary than the actual target location, but will attempt to remain within 25 feet of the target.

3 SAMPLE HANDLING, DATA MANAGEMENT, AND QUALITY ASSURANCE/ QUALITY CONTROL

Sample handling, data management, and quality assurance/quality control (QA/QC) procedures will generally be consistent with those described in the 2016 Work Plan, with the exceptions that the samples will be held at the laboratory until EPA provides authorization to proceed with analysis and that Performance Evaluation (PE) samples will be prepared for analysis of Aroclor polychlorinated biphenyls (PCBs) as discussed below. GE will provide split samples to EPA following the same procedures that were implemented in 2016. These split samples may be analyzed by EPA for grain size; a sub-set of the split samples may also be analyzed by EPA for PCB congeners by Method 1668.

Sediment samples collected by GE will be analyzed for Aroclor PCBs using Method GEHR8082 and for total organic carbon (TOC) using the Lloyd Kahn Method. Analytical procedures for those parameters are described in the SOPs submitted on October 9, 2017 in Corrective Action Memorandum No. 16 (ESI 2017). If EPA elects to analyze samples for grain size distribution, the analysis will be performed using ASTM D422-63 in accordance with the SOP presented in Attachment C to the 2016 Work Plan.

PE samples will be prepared and analyzed for Aroclor PCBs using Method GEHR8082 as discussed in Section 11.2.1 of the *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan* (Phase 2 RAM QAPP). Three new synthetic PEs at total PCB concentrations of 1 milligram per kilogram (mg/kg) will be manufactured for this sampling event consistent with Section 11.2.1 of the Phase 2 RAM QAPP and identified as PE33 (1:1 ratio of Aroclor 1221:Aroclor 1242), PE34 (3:1 ratio of Aroclor 1221:Aroclor 1242), and PE35 (4:1 ratio of Aroclor 1221:Aroclor 1242). Matrix spike/matrix spike duplicate samples will not be prepared and analyzed when PE samples are used in the QC regime. A laboratory control sample at a total PCB concentration of 1 mg/kg (3:1 ratio of Aroclor 1221:Aroclor 1242) will continue to be used consistent with Section 4 of Attachment A to the Phase 2 RAM QAPP.

4 SCHEDULE, HEALTH AND SAFETY, AND REPORTING

The surface sediment sampling to be conducted in accordance with this Addendum will be initiated in the fall of 2017 within approximately 2 weeks of EPA approval of this Addendum. The sampling will generally be conducted from north to south; however, due to the limited remaining field season, priority will be given to the sampling inside of the dredge areas as time or safety conditions necessitate. If the sampling cannot be completed in 2017, the remainder of the sampling will be deferred until 2018. Health and safety procedures will be consistent with the GE Hudson River Safety Program, as described in the *Phase 2 Remedial Action Health and Safety Plan for 2016* (Parsons 2016).

Laboratory analytical results are expected within approximately 20 business days after submission of the samples to the laboratory and EPA's authorization to release the samples for analysis. An electronic data export containing the most recent version of the data at the time of file creation will be made available to EPA on a periodic basis following electronic verification and a preliminary data review. Upon receipt of all the sampling results from the sampling conducted in 2017, the results will be subject to data validation in accordance with the Phase 2 RAM QAPP. The data validation process will be completed within 45 days after receipt of all sample results to document data usability. These validated data will be provided to EPA as soon as practicable after the data validation is completed. The validated results of the 2017 sampling will also be provided in the annual Data Summary Report (DSR) to be submitted by April 1, 2018. The DSR will include full documentation of the 2017 sampling, including a summary of the work performed, a tabulation of results, field notes, processing data, chain-of-custody forms, corrective action memoranda and technical memoranda, copies of field and laboratory audits, data validation results, copies of laboratory reports, and an electronic version of the project database.

5 REFERENCES

Anchor QEA (Anchor QEA, LLC) and ESI (Environmental Standards, Inc.), 2012. *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan.* Hudson River PCBs Superfund Site. Prepared for General Electric Company, Albany, New York. May 2012.

Anchor QEA, 2016. *Surface Sediment Sampling Work Plan for 2016*. Hudson River PCBs Superfund Site. Prepared for General Electric Company, Albany, New York. Revised October 2016.

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EPA (U.S. Environmental Protection Agency), 2010a. *Statement of Work for Remedial Action and Operations, Maintenance, and Monitoring*, Appendix B to the Consent Decree for the Hudson River PCBs Superfund Site. December 2010.

EPA, 2010b. *Operations, Maintenance, and Monitoring for Phase 2 of the Remedial Action*, Attachment E to the Statement of Work, Hudson River PCBs Site. December 2010.

ESI, 2017. Corrective Action Memorandum No. 16, Transition of PCB Aroclor Analysis from Pace Schenectady to Pace Minneapolis. October 2017.

Parsons, 2016. *Phase 2 Remedial Action Health and Safety Plan for 2016*, *Hudson River PCBs Superfund Site*. Prepared for General Electric Co., Albany, New York. February 2016.

TABLES

Table A-1
2017 Surface Sediment Sample Collection Summary

River Section	No. of Sampling Locations (Inside Dredge Areas)	No. of Sampling Locations (Outside Dredge Areas)	Analyses	Analytical Method	Container Specifications	Preservation	Turnaround Time[1]	Holding Time[2]
1	31	0	Aroclor PCBs	GEHR8082	4-oz glass jar	Cool, 4 °C +/- 2 °C	Standard	14 days to extraction, 40 days to analysis
			TOC	Lloyd Kahn	From same 4-oz glass jar as above	Cool, 4 °C +/- 2 °C	Standard	28 days
2	52	0	Aroclor PCBs	GEHR8082	4-oz glass jar	Cool, 4 °C +/- 2 °C	Standard	14 days to extraction, 40 days to analysis
			TOC	Lloyd Kahn	From same 4-oz glass jar as above	Cool, 4 °C +/- 2 °C	Standard	28 days
3	66	100	Aroclor PCBs	GEHR8082	4-oz glass jar	Cool, 4 °C +/- 2 °C	Standard	14 days to extraction, 40 days to analysis
			TOC	Lloyd Kahn	From same 4-oz glass jar as above	Cool, 4 °C +/- 2 °C	Standard	28 days

Notes:

1. All turnaround times (TATs) run from time of Verified Time of Sample Receipt.
2. Holding times start on the date of collection.

NA = not analyzed/applicable
oz = ounces
PCB = polychlorinated
TOC = total organic carbon

Table A-2
Primary Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
ICU_036	1	194	733984.8	1616293.9
ICU_037	1	194	734422.7	1615687.3
ICU_038	1	194	734900.4	1615207.5
ICU_039	1	194	736126.0	1614458.6
ICU_040	1	193	735226.2	1613976.7
ICU_041	1	193	735416.5	1613145.0
ICU_042	1	193	735707.8	1612435.4
ICU_043	1	193	734670.4	1611056.6
ICU_044	1	193	733846.5	1610135.3
ICU_045	1	192	733126.6	1609372.7
ICU_046	1	192	733106.2	1608589.1
ICU_047	1	192	732338.2	1607973.9
ICU_048	1	192	732922.3	1606985.9
ICU_049	1	192	732759.1	1605963.2
ICU_050	1	192	733707.9	1605016.3
ICU_051	1	191	733647.8	1604249.3
ICU_052	1	191	733870.8	1603844.1
ICU_053	1	191	735322.8	1603117.5
ICU_054	1	191	735581.8	1602275.1
ICU_055	1	191	735924.0	1601515.2
ICU_056	1	191	736262.5	1600728.4
ICU_057	1	190	736097.6	1600116.7
ICU_058	1	190	736805.8	1599536.0
ICU_059	1	190	736773.6	1597086.8
ICU_060	1	190	736297.0	1596162.1
ICU_061	1	190	737844.3	1595575.5
ICU_062	1	189	735842.0	1594890.5
ICU_063	1	189	736143.4	1594136.0
ICU_064	1	189	736847.5	1592896.9
ICU_065	1	189	736400.7	1591927.4
ICU_066	1	189	736495.2	1591096.7
ICU_137	2	188	736163.8	1586821.6
ICU_138	2	188	736442.2	1586262.1
ICU_139	2	188	736462.3	1585937.8
ICU_140	2	187	737393.8	1585723.7
ICU_141	2	187	737053.6	1584725.1
ICU_142	2	187	736079.8	1583766.0
ICU_143	2	187	736113.8	1583449.0
ICU_144	2	187	735960.4	1583135.8
ICU_145	2	187	735998.8	1582774.5
ICU_146	2	187	735788.8	1582515.0
ICU_147	2	187	735493.6	1581777.0

Table A-2
Primary Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
ICU_148	2	187	735298.4	1581429.4
ICU_149	2	187	735065.9	1581328.3
ICU_150	2	186	735096.1	1580902.3
ICU_151	2	186	734956.3	1580609.8
ICU_152	2	186	735336.7	1580343.0
ICU_153	2	186	736750.9	1580095.7
ICU_154	2	186	737739.8	1577238.9
ICU_155	2	185	737665.0	1576767.8
ICU_156	2	185	737902.7	1576660.3
ICU_157	2	185	737887.3	1576518.4
ICU_158	2	185	737637.5	1576362.6
ICU_159	2	185	737716.5	1576267.2
ICU_160	2	185	737574.4	1576237.8
ICU_161	2	185	737470.9	1576198.8
ICU_162	2	185	737603.8	1576064.0
ICU_163	2	185	738040.2	1575929.5
ICU_164	2	185	738083.8	1575776.7
ICU_165	2	185	737831.5	1575607.1
ICU_166	2	185	737756.2	1575507.8
ICU_167	2	185	737798.6	1575430.4
ICU_168	2	185	737299.1	1573641.7
ICU_169	2	185	735768.8	1572353.8
ICU_170	2	184	736088.2	1572162.2
ICU_171	2	184	735656.4	1571431.8
ICU_172	2	184	735051.5	1569581.5
ICU_173	2	184	735111.4	1569243.2
ICU_174	2	184	734944.2	1568877.8
ICU_175	2	184	735049.6	1568669.9
ICU_176	2	184	734770.4	1568369.8
ICU_177	2	184	735134.3	1568265.8
ICU_178	2	184	734871.2	1567954.0
ICU_179	2	184	734892.4	1567745.6
ICU_180	2	184	735356.9	1567416.2
ICU_181	2	184	735007.6	1567307.9
ICU_182	2	184	735694.6	1566976.1
ICU_183	2	184	736032.3	1566524.1
ICU_184	2	184	736334.9	1566353.3
ICU_185	2	184	736169.0	1566302.4
ICU_186	2	184	736083.1	1566125.3
ICU_187	2	184	735409.2	1565998.3
ICU_188	2	184	735917.3	1565673.6
ICU_310	3	181	738968.6	1558018.3

Table A-2
Primary Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
ICU_311	3	180	737928.0	1552671.4
ICU_312	3	180	738634.7	1549064.4
ICU_313	3	179	737815.7	1545472.9
ICU_314	3	178	738896.7	1540538.1
ICU_315	3	178	738263.3	1540204.1
ICU_316	3	178	738191.3	1539686.9
ICU_317	3	177	736740.0	1538081.0
ICU_318	3	177	736620.0	1537835.0
ICU_319	3	177	736268.0	1537621.0
ICU_320	3	177	736139.0	1537801.0
ICU_321	3	177	736045.0	1537630.0
ICU_322	3	177	735950.0	1537843.0
ICU_323	3	177	736420.3	1535035.9
ICU_324	3	177	736371.2	1534682.9
ICU_325	3	176	735676.3	1533933.4
ICU_326	3	176	735407.8	1533663.9
ICU_327	3	176	735243.4	1533405.0
ICU_328	3	176	735272.7	1533267.7
ICU_329	3	175	735437.6	1528664.6
ICU_330	3	175	735484.4	1528299.3
ICU_331	3	175	734199.4	1524522.4
ICU_332	3	173	731123.1	1515354.0
ICU_333	3	172	731049.0	1514195.7
ICU_334	3	171	726344.1	1510214.2
ICU_335	3	171	725200.4	1509647.9
ICU_336	3	171	724906.5	1509372.4
ICU_337	3	171	724834.0	1507470.7
ICU_338	3	170	724900.5	1506832.2
ICU_339	3	170	725053.5	1506309.0
ICU_340	3	170	725059.0	1506101.4
ICU_341	3	170	725234.3	1505364.0
ICU_342	3	170	725570.0	1503522.7
ICU_343	3	170	725582.9	1503352.7
ICU_344	3	170	725589.6	1503235.6
ICU_345	3	170	725607.7	1502700.0
ICU_346	3	170	725613.7	1502509.0
ICU_347	3	169	725333.4	1501430.3
ICU_348	3	169	725075.6	1500124.9
ICU_349	3	169	724944.1	1500047.5
ICU_350	3	169	724976.4	1499904.4
ICU_351	3	169	724780.5	1499230.6
ICU_352	3	169	725103.0	1498989.0

Table A-2
Primary Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
ICU_353	3	169	722508.9	1497305.7
ICU_354	3	169	722513.0	1497234.8
ICU_355	3	168	720642.2	1497072.2
ICU_356	3	168	723006.8	1496868.4
ICU_357	3	166	713359.5	1489056.0
ICU_358	3	166	712779.8	1488788.9
ICU_359	3	166	712649.3	1488578.7
ICU_360	3	166	712343.4	1488432.8
ICU_361	3	166	712508.7	1488245.4
ICU_362	3	165	710430.0	1482761.4
ICU_363	3	165	710499.0	1482444.2
ICU_364	3	164	712384.1	1477520.9
ICU_365	3	164	712855.1	1477361.5
ICU_366	3	164	712605.0	1477269.5
ICU_367	3	163	712900.5	1477208.4
ICU_368	3	163	713070.5	1477040.0
ICU_369	3	163	711334.8	1475667.7
ICU_370	3	162	712792.4	1468996.5
ICU_371	3	160	715692.2	1459699.6
ICU_372	3	160	715989.1	1459094.7
ICU_373	3	158	718337.3	1451173.5
ICU_374	3	158	718200.8	1450403.5
ICU_375	3	157	716797.9	1446179.4

Table A-3
Backup Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID[1]	River Section	River Mile	Easting	Northing
ICU-B036	1	189	736411.9	1593324.6
ICU-B037	1	189	736081.0	1594402.7
ICU-B038	1	189	736218.2	1591573.2
ICU-B039	1	189	736492.3	1592928.0
ICU-B040	1	189	735995.8	1594116.5
ICU-B041	1	190	736531.3	1600036.7
ICU-B042	1	190	736851.4	1597768.7
ICU-B043	1	190	736316.7	1596209.8
ICU-B044	1	190	736310.9	1600220.4
ICU-B045	1	190	736252.9	1599845.0
ICU-B046	1	191	735439.3	1602382.7
ICU-B047	1	191	735418.4	1602892.4
ICU-B048	1	191	735928.2	1600941.8
ICU-B049	1	191	735748.2	1601919.3
ICU-B050	1	191	735568.0	1601625.2
ICU-B051	1	191	735902.5	1602326.3
ICU-B052	1	192	733154.7	1605250.1
ICU-B053	1	192	732589.4	1606159.2
ICU-B054	1	192	733387.7	1605041.4
ICU-B055	1	192	732947.2	1608427.8
ICU-B056	1	192	732799.2	1608262.0
ICU-B057	1	192	732658.0	1607574.0
ICU-B058	1	193	734228.1	1610693.1
ICU-B059	1	193	735308.0	1612475.0
ICU-B060	1	193	734257.8	1610321.9
ICU-B061	1	193	733801.5	1609771.0
ICU-B062	1	193	734896.7	1611449.5
ICU-B063	1	194	734769.7	1615503.0
ICU-B065	1	194	734626.0	1615305.7
ICU-B066	1	194	736048.6	1614527.6
ICU-B137	2	184	735698.7	1572195.8
ICU-B138	2	184	735693.2	1572152.6
ICU-B139	2	184	735051.6	1568246.0
ICU-B140	2	184	734864.0	1568255.6
ICU-B141	2	184	735122.7	1570108.5
ICU-B142	2	184	734983.9	1569469.2
ICU-B143	2	184	735251.2	1571344.3
ICU-B144	2	184	735061.8	1567969.5
ICU-B145	2	184	735122.2	1568320.3
ICU-B146	2	184	736156.7	1572137.3
ICU-B147	2	184	735031.6	1568408.7
ICU-B148	2	185	737874.3	1575993.4

Table A-3
Backup Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID[1]	River Section	River Mile	Easting	Northing
ICU-B149	2	185	738232.6	1575889.8
ICU-B150	2	185	738151.7	1575466.6
ICU-B151	2	185	738035.2	1576368.3
ICU-B152	2	185	738087.1	1575757.7
ICU-B153	2	185	737202.2	1573626.3
ICU-B154	2	185	737379.6	1573796.3
ICU-B155	2	185	736289.8	1572475.3
ICU-B156	2	185	737832.6	1575869.6
ICU-B157	2	185	738108.8	1576023.2
ICU-B158	2	185	737902.6	1576387.9
ICU-B159	2	185	737737.1	1576891.7
ICU-B160	2	185	737991.7	1575977.9
ICU-B161	2	185	738224.5	1575788.1
ICU-B162	2	185	737847.5	1575859.4
ICU-B163	2	186	735298.9	1580266.7
ICU-B164	2	186	737764.8	1577177.5
ICU-B165	2	186	735482.5	1580194.1
ICU-B166	2	186	734916.9	1580723.6
ICU-B167	2	186	735246.2	1580204.4
ICU-B168	2	187	735858.2	1583005.9
ICU-B169	2	187	736319.1	1583658.5
ICU-B170	2	187	735773.1	1582328.8
ICU-B171	2	187	736226.1	1583594.2
ICU-B172	2	187	736106.0	1585207.8
ICU-B173	2	187	735775.6	1582268.6
ICU-B174	2	187	735065.2	1581586.8
ICU-B175	2	187	735772.3	1582361.9
ICU-B176	2	187	735612.3	1583261.3
ICU-B177	2	187	735360.0	1581581.5
ICU-B178	2	188	736468.0	1586006.6
ICU-B179	2	188	736373.0	1586563.5
ICU-B180	2	188	737417.2	1585949.2
ICU-B181	2	183.5	735162.5	1567124.6
ICU-B182	2	183.5	735836.1	1565729.5
ICU-B183	2	183.5	735468.5	1566874.7
ICU-B184	2	183.5	736209.6	1565836.8
ICU-B185	2	183.5	735955.2	1566593.3
ICU-B186	2	183.5	735447.3	1566825.6
ICU-B187	2	183.5	735895.9	1565724.3
ICU-B188	2	183.5	736220.7	1566464.5
ICU-B310	3	157	717086.3	1447773.4
ICU-B311	3	158	718140.9	1450357.4

Table A-3
Backup Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID[1]	River Section	River Mile	Easting	Northing
ICU-B312	3	158	718165.3	1450238.5
ICU-B313	3	160	715843.5	1459553.2
ICU-B314	3	160	716017.3	1459077.3
ICU-B315	3	162	712849.0	1468973.0
ICU-B316	3	163	711228.2	1476039.0
ICU-B317	3	163	712761.0	1477144.9
ICU-B318	3	163	712971.1	1476921.1
ICU-B319	3	164	712698.6	1477316.2
ICU-B320	3	164	710244.4	1479320.8
ICU-B321	3	164	712545.7	1477274.8
ICU-B322	3	165	710440.3	1482936.7
ICU-B323	3	165	710493.1	1482465.7
ICU-B324	3	166	712129.9	1488377.1
ICU-B325	3	166	712587.8	1488653.8
ICU-B326	3	166	713051.3	1488800.9
ICU-B327	3	166	712619.5	1488140.1
ICU-B328	3	166	712509.5	1488317.5
ICU-B329	3	168	722895.0	1496832.0
ICU-B330	3	168	723409.2	1497007.1
ICU-B331	3	169	724812.6	1499087.1
ICU-B332	3	169	724601.1	1498677.2
ICU-B333	3	169	725496.3	1501573.9
ICU-B334	3	169	724677.4	1499018.2
ICU-B335	3	169	725202.9	1500960.4
ICU-B336	3	169	723455.2	1497239.1
ICU-B337	3	169	722351.0	1497248.8
ICU-B338	3	169	725318.2	1500872.5
ICU-B339	3	170	724965.1	1506179.0
ICU-B340	3	170	724979.8	1506402.5
ICU-B341	3	170	725517.4	1503518.6
ICU-B342	3	170	725226.4	1505584.2
ICU-B343	3	170	725050.4	1506321.9
ICU-B344	3	170	725296.2	1505312.7
ICU-B345	3	170	725610.4	1502864.0
ICU-B346	3	170	725556.7	1503081.1
ICU-B347	3	170	724986.0	1506550.2
ICU-B348	3	171	724847.0	1507482.2
ICU-B349	3	171	724390.9	1508522.2
ICU-B350	3	171	726279.7	1510195.4
ICU-B351	3	171	724884.1	1509306.9
ICU-B352	3	172	728290.4	1511314.9
ICU-B353	3	173	731126.0	1515392.3

Table A-3
Backup Target Surface Sediment Sampling
Locations Inside of Dredge Areas

EPA Location ID[1]	River Section	River Mile	Easting	Northing
ICU-B354	3	175	735412.5	1528792.1
ICU-B355	3	175	734187.9	1524484.3
ICU-B356	3	175	735507.2	1527966.7
ICU-B357	3	176	735686.0	1534099.0
ICU-B358	3	176	735229.6	1533333.3
ICU-B359	3	176	735411.3	1533586.6
ICU-B360	3	176	735050.6	1532780.0
ICU-B361	3	177	736636.4	1538029.6
ICU-B362	3	177	736567.3	1537886.0
ICU-B363	3	177	735947.7	1537808.1
ICU-B364	3	177	736605.3	1537832.3
ICU-B365	3	177	736550.1	1537972.4
ICU-B366	3	177	736108.1	1537854.0
ICU-B367	3	177	735887.6	1537773.4
ICU-B368	3	177	736595.4	1537797.2
ICU-B369	3	178	738214.6	1539881.5
ICU-B370	3	178	738919.1	1540174.9
ICU-B371	3	178	738247.9	1539829.2
ICU-B372	3	179	737788.7	1545462.8
ICU-B373	3	180	739212.6	1550160.0
ICU-B374	3	180	738017.4	1552657.6
ICU-B375	3	181	738958.4	1557964.2

Notes:

1. EPA location ICU-B064 was located outside of any dredge area; therefore, that location is not included in this table.

EPA = U.S. Environmental Protection Agency

Table A-4
Primary Target Surface Sediment Sampling
Locations Outside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
OCU_376	3	181	739797.98	1555986.79
OCU_377	3	181	739001.07	1557777.37
OCU_378	3	181	739099.31	1553891.66
OCU_379	3	180	739197.36	1550465.87
OCU_380	3	180	738080.98	1551585.00
OCU_381	3	180	738640.06	1553171.45
OCU_382	3	180	738566.98	1549915.85
OCU_383	3	179	737322.34	1545005.04
OCU_384	3	179	738756.46	1547414.69
OCU_385	3	179	737521.45	1544011.52
OCU_386	3	179	737955.14	1546710.35
OCU_387	3	178	738273.98	1542164.25
OCU_388	3	178	737953.35	1538747.60
OCU_389	3	178	737980.21	1542457.09
OCU_390	3	178	737984.61	1542061.23
OCU_391	3	177	736160.34	1536563.94
OCU_392	3	177	737271.61	1537819.56
OCU_393	3	177	738035.10	1538519.74
OCU_394	3	176	736288.25	1534332.09
OCU_395	3	176	735050.69	1529847.72
OCU_396	3	176	735446.57	1532843.10
OCU_397	3	176	735220.57	1532407.99
OCU_398	3	175	735101.83	1528102.83
OCU_399	3	175	734514.22	1524542.69
OCU_400	3	175	735208.72	1528987.25
OCU_401	3	175	734598.06	1524331.62
OCU_402	3	174	732716.23	1520970.24
OCU_403	3	174	733790.46	1523087.97
OCU_404	3	174	733166.29	1521749.00
OCU_405	3	174	731739.14	1520049.28
OCU_406	3	173	731116.89	1518893.40
OCU_407	3	173	730777.41	1515523.18
OCU_408	3	173	730663.32	1517819.45
OCU_409	3	173	731465.14	1519472.78
OCU_410	3	172	730724.26	1513834.55
OCU_411	3	172	730559.08	1514419.23
OCU_412	3	172	730485.65	1514347.70
OCU_413	3	172	730171.25	1511921.59
OCU_414	3	171	728297.72	1510733.46
OCU_415	3	171	725046.74	1509283.98
OCU_416	3	171	727270.74	1510094.98
OCU_417	3	171	726542.01	1509972.98

Table A-4
Primary Target Surface Sediment Sampling
Locations Outside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
OCU_418	3	171	726792.65	1510394.24
OCU_419	3	170	725082.59	1503479.57
OCU_420	3	170	725442.81	1504781.05
OCU_421	3	170	724501.62	1506489.46
OCU_422	3	170	724979.09	1503290.93
OCU_423	3	169	725202.59	1499988.58
OCU_424	3	169	724147.31	1498020.91
OCU_425	3	169	723212.02	1497674.97
OCU_426	3	169	723885.70	1497800.63
OCU_427	3	169	723938.53	1497983.71
OCU_428	3	169	725448.62	1501339.56
OCU_429	3	169	724024.06	1499068.98
OCU_430	3	168	721085.86	1496936.34
OCU_431	3	168	722748.44	1496896.53
OCU_432	3	166	713875.88	1490395.55
OCU_433	3	166	714221.51	1490525.11
OCU_434	3	166	714902.72	1490482.54
OCU_435	3	166	713754.95	1490021.43
OCU_436	3	166	714458.41	1489689.08
OCU_437	3	165	711019.75	1482634.68
OCU_438	3	164	711210.11	1479908.83
OCU_439	3	164	712207.17	1477556.51
OCU_440	3	164	710415.11	1479466.35
OCU_441	3	163	711966.50	1475941.36
OCU_442	3	162	713243.11	1470692.80
OCU_443	3	162	713589.84	1471277.73
OCU_444	3	162	712688.02	1468117.43
OCU_445	3	161	714217.54	1465676.15
OCU_446	3	161	713323.65	1467833.31
OCU_447	3	161	713284.77	1467802.78
OCU_448	3	160	714199.84	1460700.51
OCU_449	3	160	714856.53	1460369.85
OCU_450	3	160	714324.75	1460739.49
OCU_451	3	160	714369.90	1461707.09
OCU_452	3	160	714270.44	1462383.78
OCU_453	3	159	718657.35	1454466.96
OCU_454	3	159	718817.48	1453132.71
OCU_455	3	159	716685.01	1457371.68
OCU_456	3	159	716000.24	1456551.58
OCU_457	3	158	717874.07	1448942.10
OCU_458	3	158	718275.72	1450285.13
OCU_459	3	158	718182.45	1449370.49

Table A-4
Primary Target Surface Sediment Sampling
Locations Outside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
OCU_460	3	158	717343.63	1452490.56
OCU_461	3	157	715257.19	1445706.79
OCU_462	3	157	717458.03	1447513.74
OCU_463	3	157	717873.00	1447856.24
OCU_464	3	156	714121.08	1441616.02
OCU_465	3	156	713673.38	1442731.64
OCU_466	3	156	713652.36	1442290.43
OCU_467	3	156	712807.37	1439646.94
OCU_468	3	155	711649.86	1434765.63
OCU_469	3	155	712108.12	1437741.13
OCU_470	3	155	712329.70	1437866.06
OCU_471	3	155	712502.30	1438002.20
OCU_472	3	154	711225.30	1433498.82
OCU_473	3	154	711507.71	1432981.80
OCU_474	3	154	710899.44	1430694.56
OCU_475	3	154	711536.79	1433449.22

Notes:

EPA = U.S. Environmental Protection Agency

Table A-5
Backup Target Surface Sediment Sampling
Locations Outside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
OCU-B376	3	181	739117.27	1556605.87
OCU-B377	3	181	739074.11	1556299.34
OCU-B378	3	181	739266.05	1556528.50
OCU-B379	3	180	738380.35	1551452.47
OCU-B380	3	180	738370.41	1551139.75
OCU-B381	3	180	738419.01	1551225.25
OCU-B382	3	180	738401.78	1552600.91
OCU-B383	3	179	737373.09	1544535.33
OCU-B384	3	179	737209.03	1544757.74
OCU-B385	3	179	738552.22	1547965.40
OCU-B386	3	179	738426.11	1547812.32
OCU-B387	3	178	738651.71	1541385.03
OCU-B388	3	178	738682.80	1540904.15
OCU-B389	3	178	738152.19	1539447.29
OCU-B390	3	178	738998.40	1540629.31
OCU-B391	3	177	736166.21	1535602.62
OCU-B392	3	177	737348.50	1538401.48
OCU-B393	3	177	736270.87	1535745.47
OCU-B394	3	176	735225.41	1532763.59
OCU-B395	3	176	734917.61	1531308.33
OCU-B396	3	176	734930.79	1529520.58
OCU-B397	3	176	735854.20	1534009.74
OCU-B398	3	175	734568.47	1524604.45
OCU-B399	3	175	735003.77	1529137.71
OCU-B400	3	175	734863.82	1528497.14
OCU-B401	3	175	735256.18	1527754.65
OCU-B402	3	174	733883.43	1522870.99
OCU-B403	3	174	734213.31	1523925.55
OCU-B404	3	174	734186.55	1523419.47
OCU-B405	3	174	731839.37	1520022.28
OCU-B406	3	173	731044.89	1517152.84
OCU-B407	3	173	730858.11	1516422.75
OCU-B408	3	173	730960.26	1517628.13
OCU-B409	3	173	731086.58	1518430.20
OCU-B410	3	172	730494.80	1512933.12
OCU-B411	3	172	730008.96	1511901.20
OCU-B412	3	172	730628.88	1514809.51
OCU-B413	3	172	729042.25	1511803.74
OCU-B414	3	171	725159.87	1509366.81
OCU-B415	3	171	724885.41	1508413.30
OCU-B416	3	171	725356.42	1509201.09
OCU-B417	3	171	724890.66	1508904.00

Table A-5
Backup Target Surface Sediment Sampling
Locations Outside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
OCU-B418	3	171	727501.84	1510439.99
OCU-B419	3	170	725125.65	1505493.51
OCU-B420	3	170	724835.07	1505862.37
OCU-B421	3	170	725454.60	1502502.96
OCU-B422	3	170	724515.55	1506861.59
OCU-B423	3	169	724150.43	1499524.70
OCU-B424	3	169	725450.01	1501273.06
OCU-B425	3	169	724077.06	1498479.64
OCU-B426	3	169	725201.56	1500426.64
OCU-B427	3	169	725371.57	1501216.06
OCU-B428	3	169	725086.52	1500776.86
OCU-B429	3	169	724227.64	1499231.90
OCU-B430	3	168	722393.46	1497126.27
OCU-B431	3	168	722387.75	1496733.90
OCU-B432	3	166	715696.82	1491043.27
OCU-B433	3	166	714557.70	1490174.19
OCU-B434	3	166	714265.05	1490715.46
OCU-B435	3	166	714966.21	1490465.14
OCU-B436	3	166	714011.44	1488724.62
OCU-B437	3	165	710840.08	1483141.27
OCU-B438	3	164	710953.76	1477319.99
OCU-B439	3	164	711383.13	1479498.41
OCU-B440	3	164	710973.70	1481875.52
OCU-B441	3	163	711113.55	1476713.91
OCU-B442	3	162	713223.66	1468012.64
OCU-B443	3	162	713726.67	1469529.67
OCU-B444	3	162	713904.93	1470621.05
OCU-B445	3	161	713179.55	1467248.86
OCU-B446	3	161	712671.22	1467444.28
OCU-B447	3	161	713119.89	1467389.96
OCU-B448	3	160	714434.63	1462393.19
OCU-B449	3	160	714090.60	1462051.30
OCU-B450	3	160	714707.71	1460429.59
OCU-B451	3	160	714346.61	1460716.57
OCU-B452	3	160	715065.46	1459889.53
OCU-B453	3	159	718878.89	1453692.94
OCU-B454	3	159	716997.85	1456526.45
OCU-B455	3	159	716606.94	1457659.40
OCU-B456	3	159	716203.06	1457691.83
OCU-B457	3	158	717872.93	1449282.08
OCU-B458	3	158	717756.59	1452863.86
OCU-B459	3	158	717853.00	1450812.22

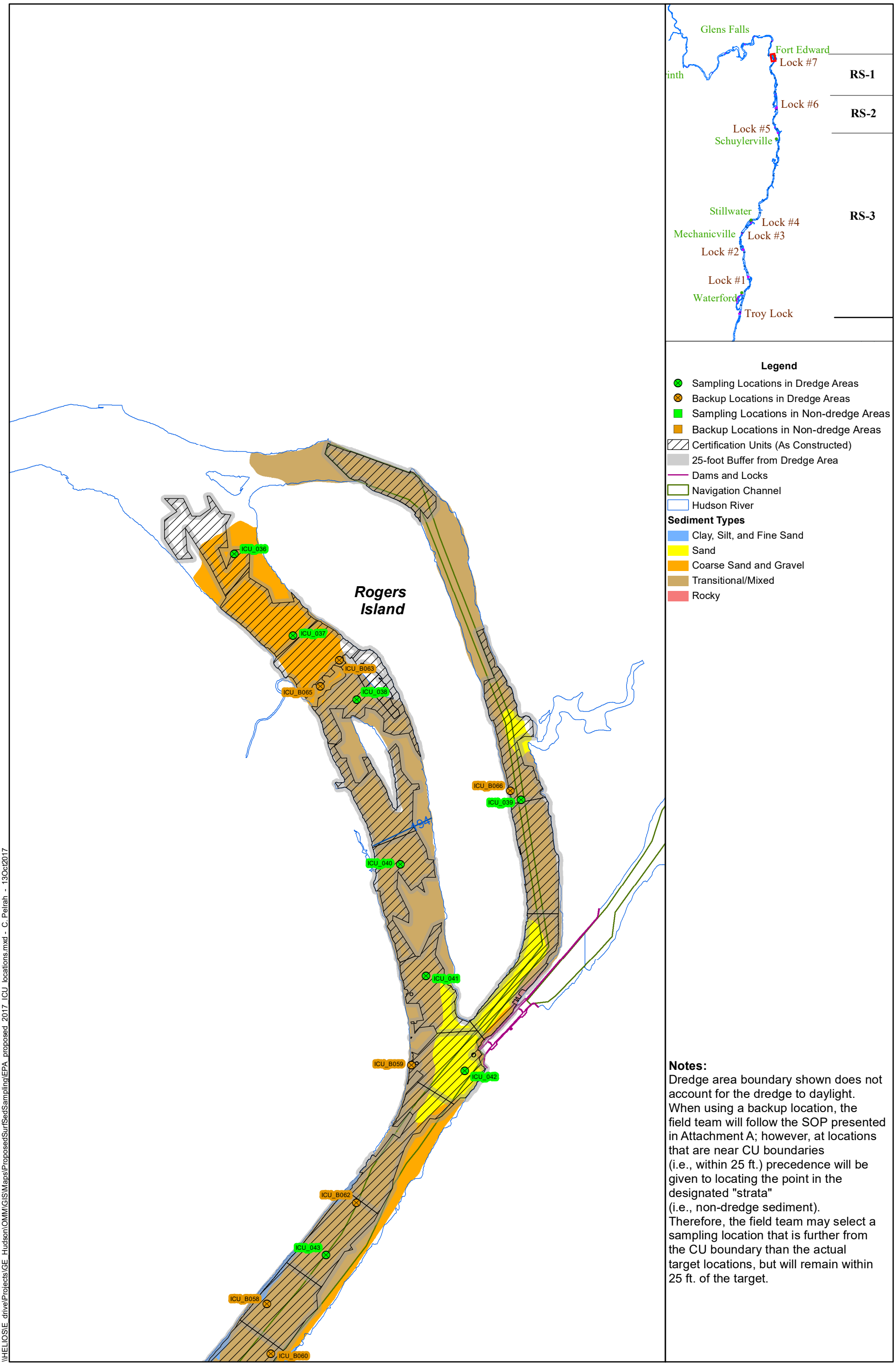
Table A-5
Backup Target Surface Sediment Sampling
Locations Outside of Dredge Areas

EPA Location ID	River Section	River Mile	Easting	Northing
OCU-B460	3	158	718898.40	1452959.53
OCU-B461	3	157	715267.00	1445766.24
OCU-B462	3	157	715382.21	1445973.90
OCU-B463	3	157	716521.23	1446655.89
OCU-B464	3	156	713872.91	1442367.19
OCU-B465	3	156	714392.53	1443757.63
OCU-B466	3	156	713979.84	1441454.42
OCU-B467	3	156	713837.46	1444299.66
OCU-B468	3	155	712055.89	1436164.16
OCU-B469	3	155	711936.02	1435268.24
OCU-B470	3	155	712408.38	1436935.71
OCU-B471	3	155	712579.41	1438221.23
OCU-B472	3	154	710687.28	1431896.71
OCU-B473	3	154	711326.20	1430096.70
OCU-B474	3	154	710914.54	1433786.16
OCU-B475	3	154	711271.10	1434032.62

Notes:

EPA = U.S. Environmental Protection Agency

FIGURES

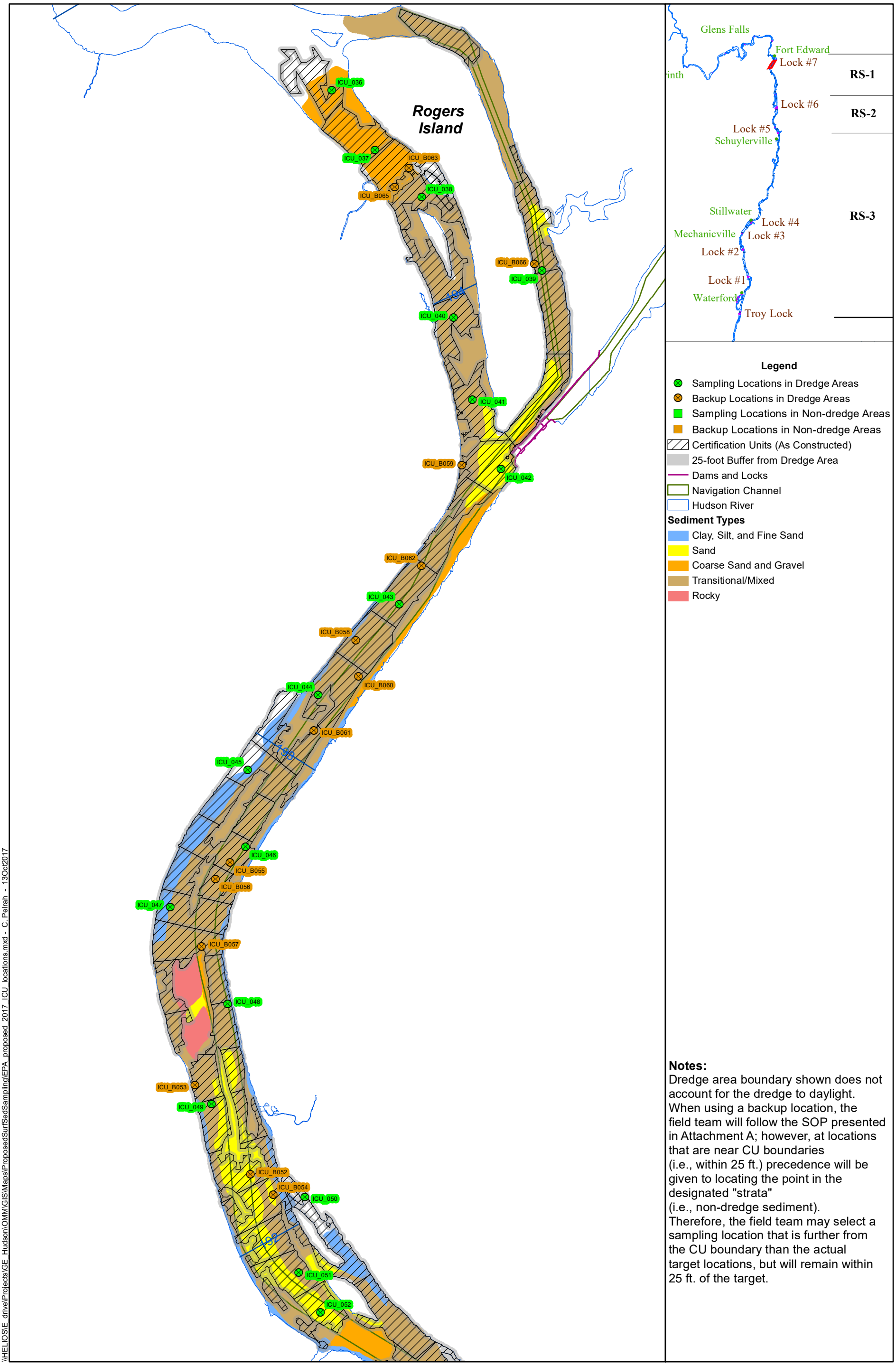


Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

ANCHOR QEA

Feet
0 740 1,480

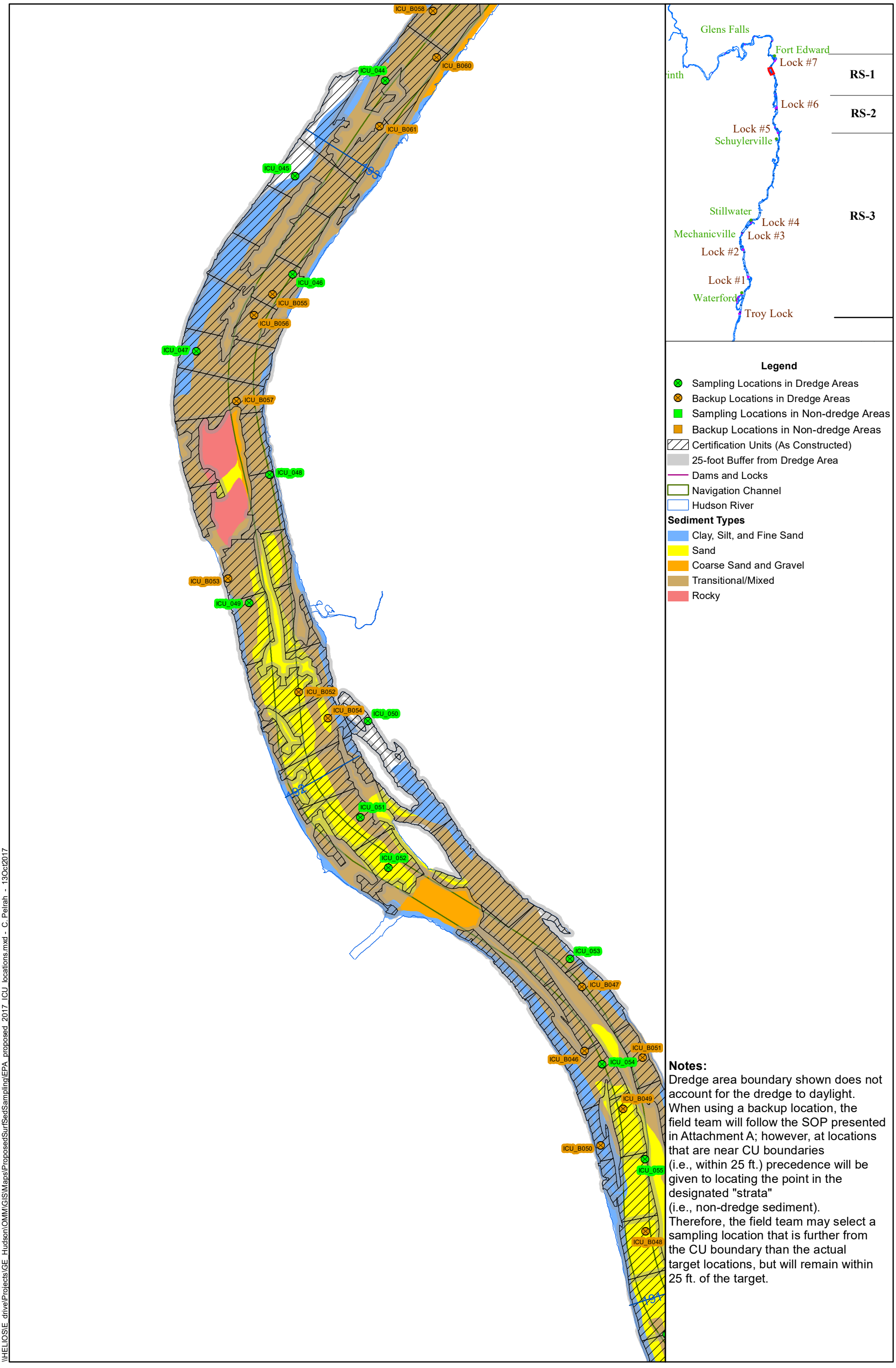
Figure A-1a
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,000 2,000

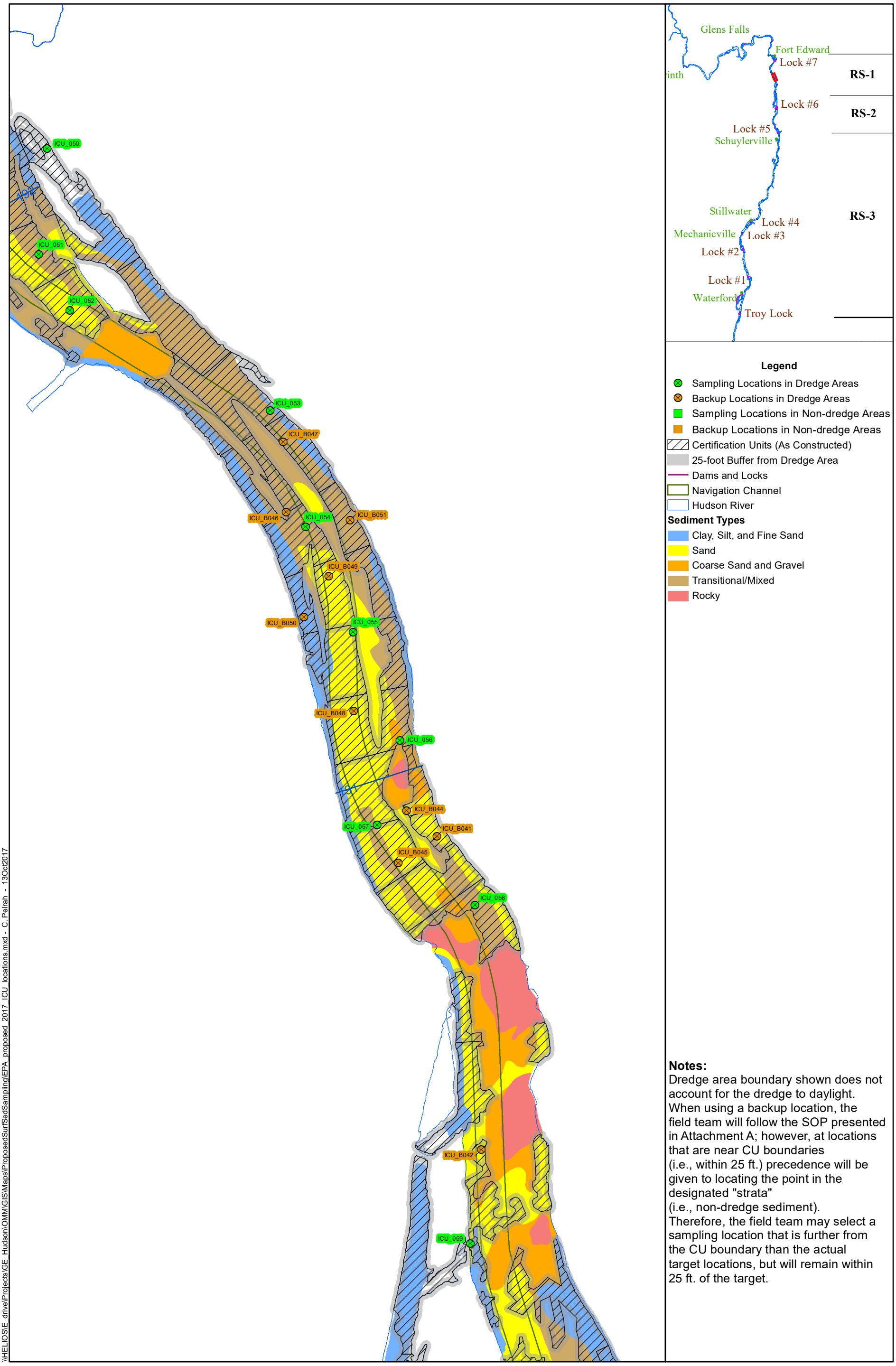
Figure A-1b
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 800 1,600

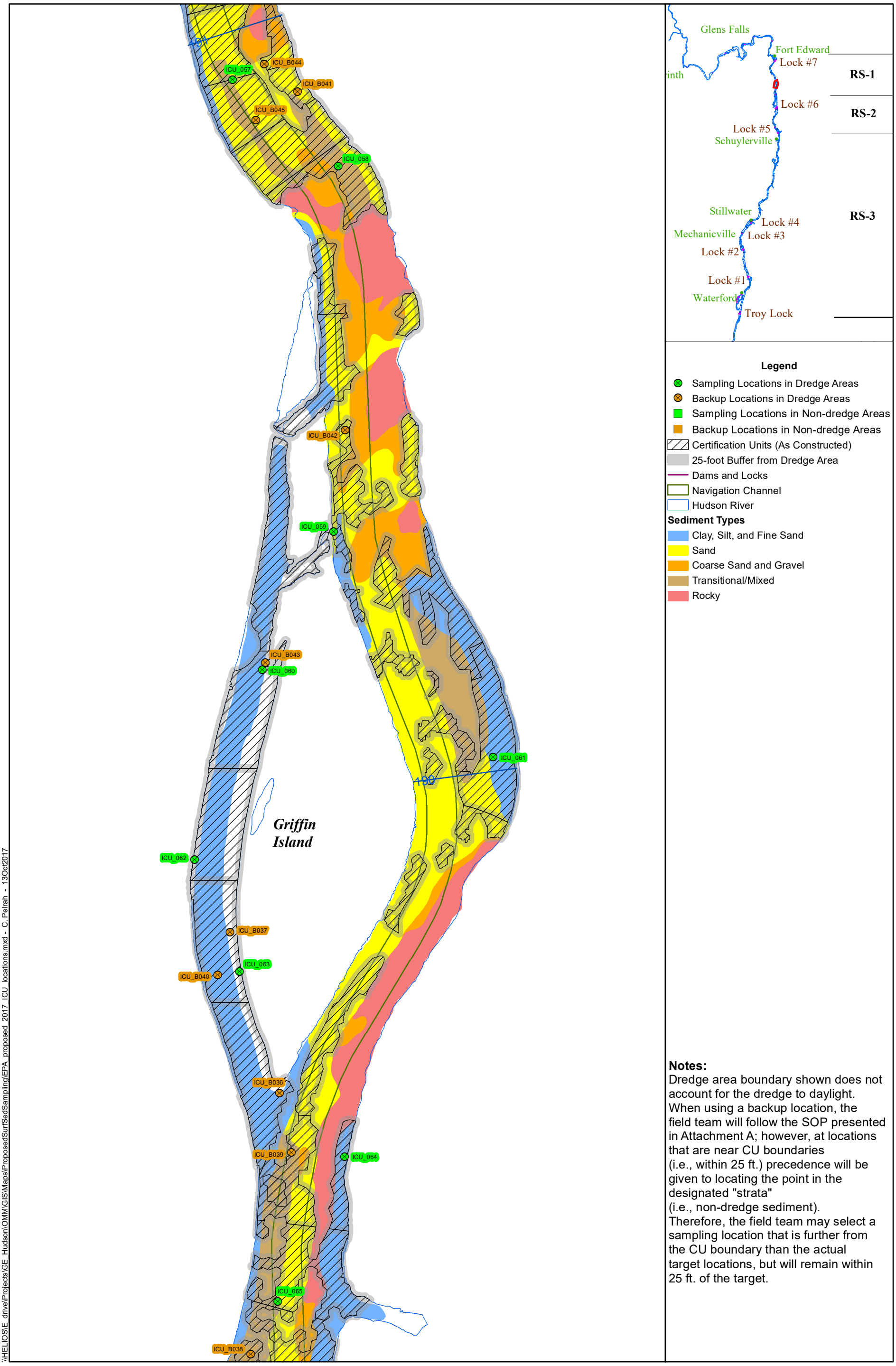
Figure A-1c
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 720 1,440

Figure A-1d
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



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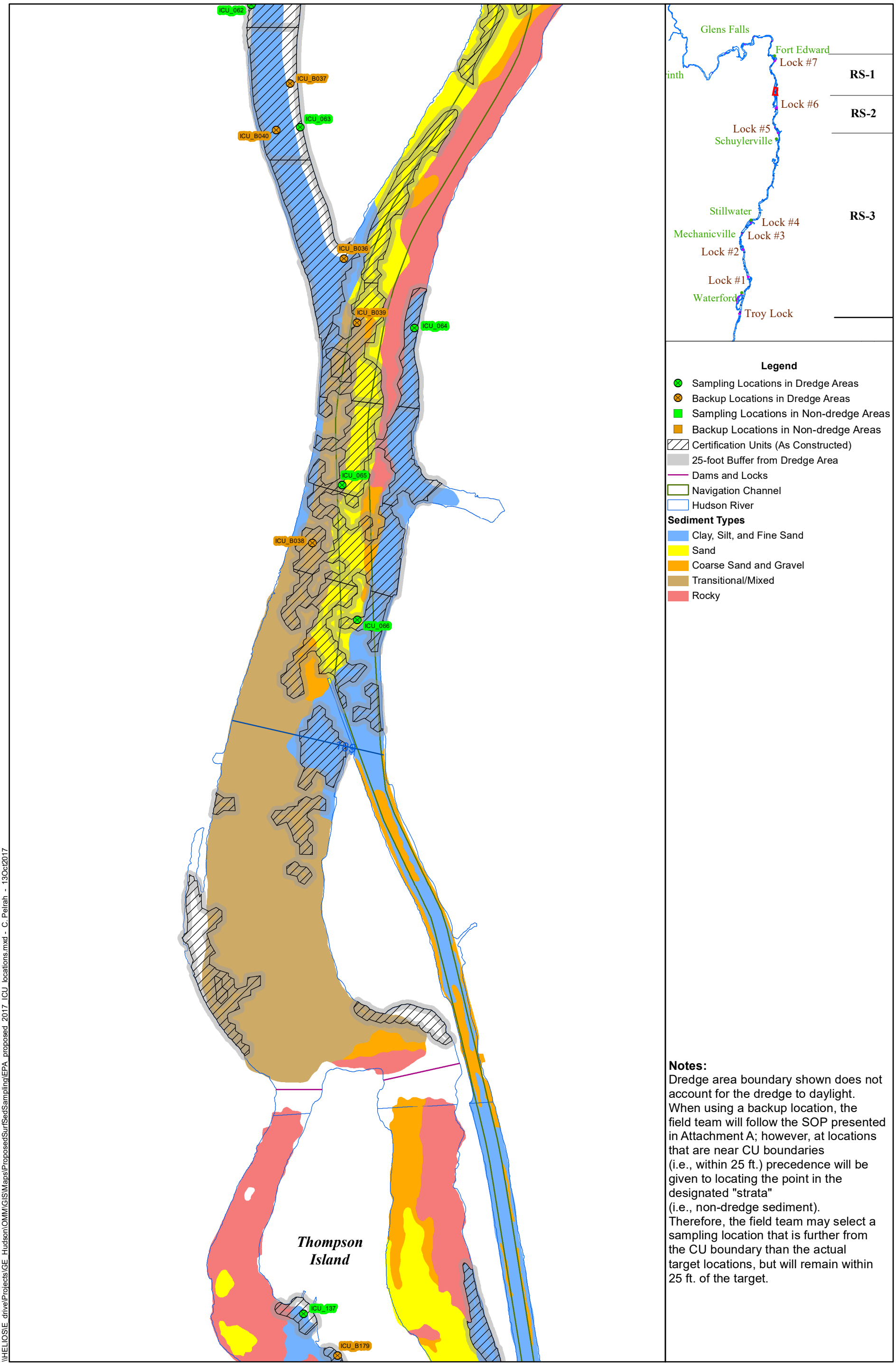
Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

ANCHOR QEA

Feet
0 670 1,340

Figure A-1e
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

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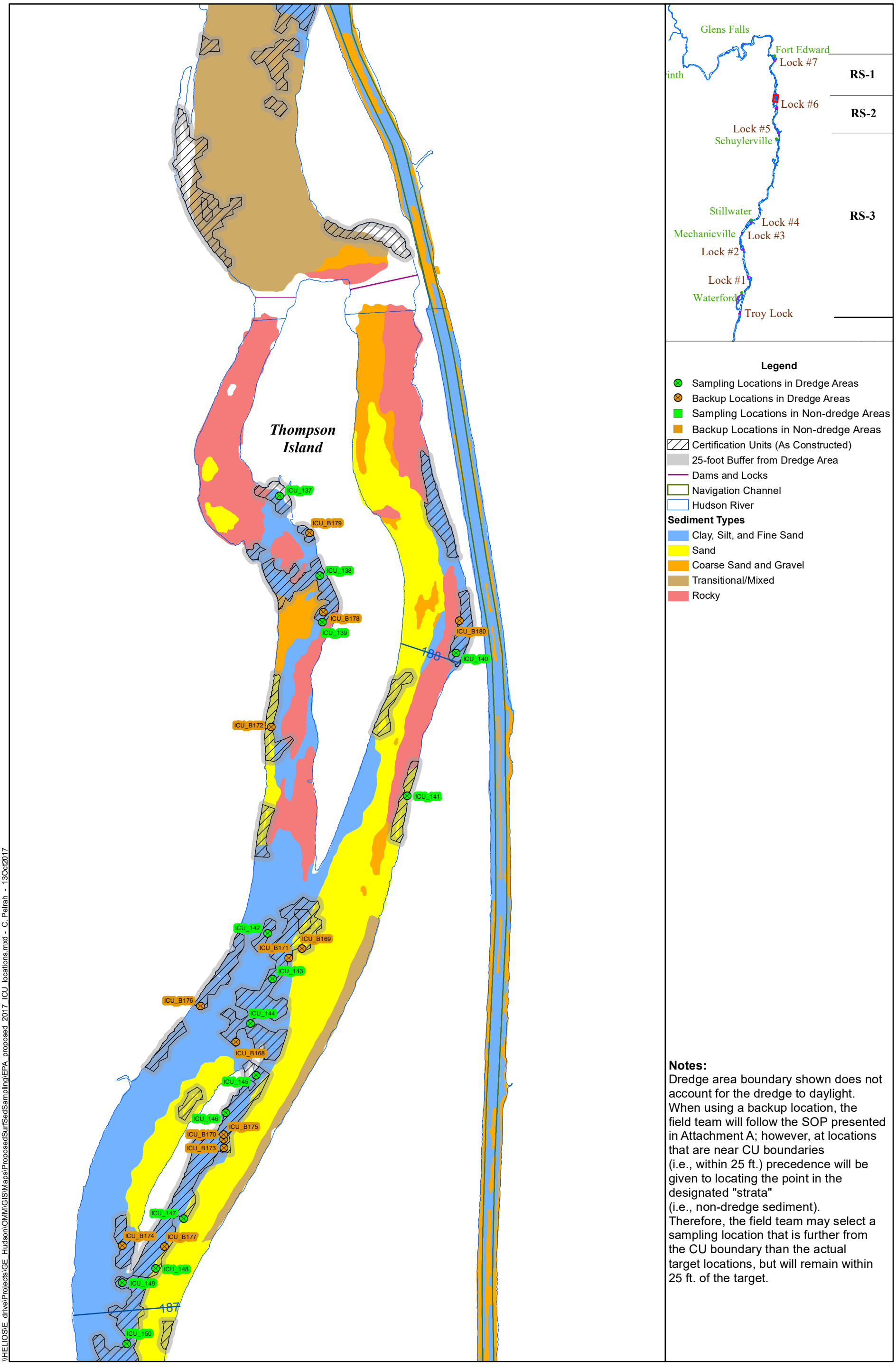
ANCHOR QEA

Feet
0 610 1,220

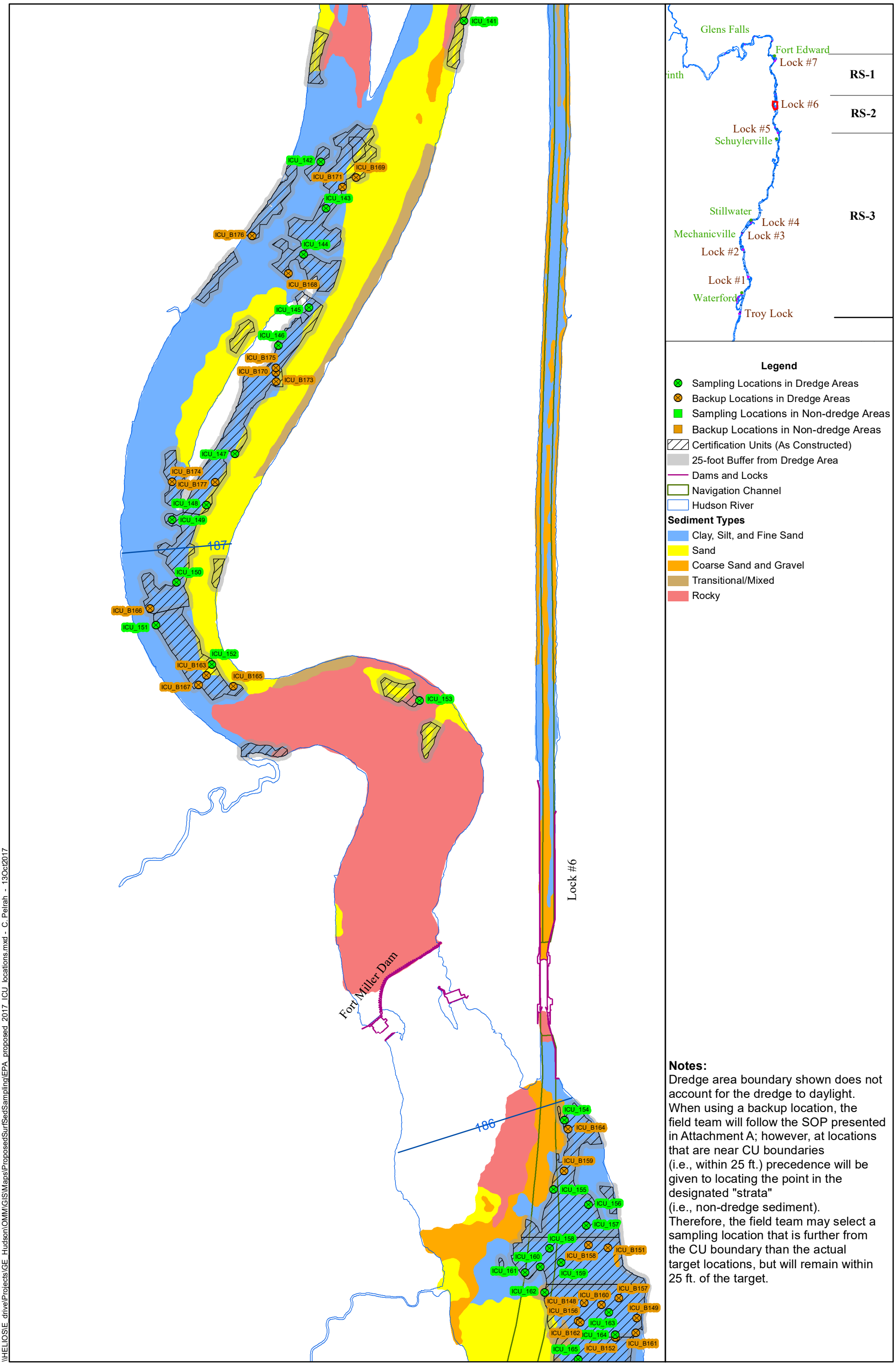
Figure A-1f
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 690 1,380

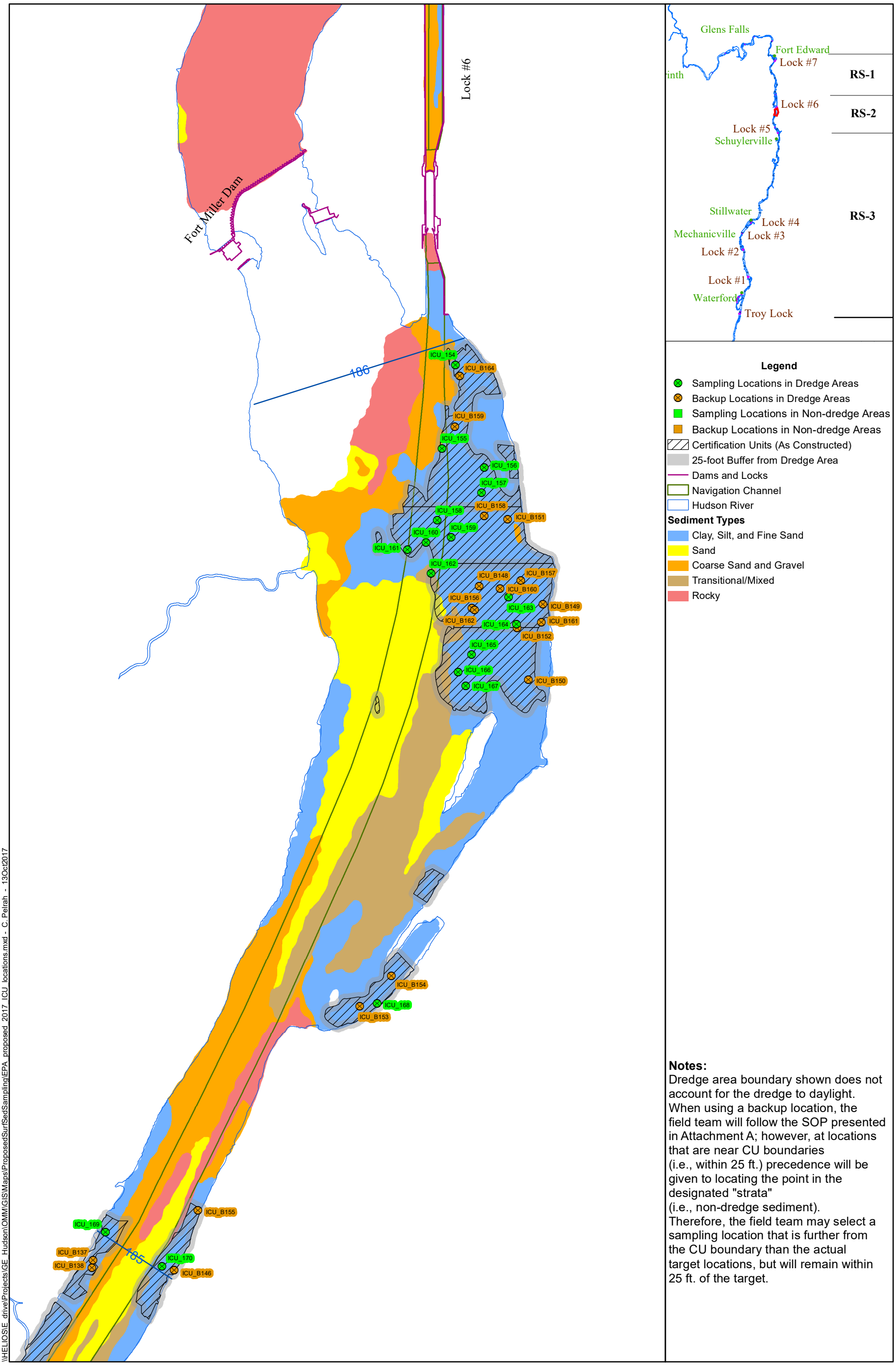
Figure A-1g
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 675 1,350

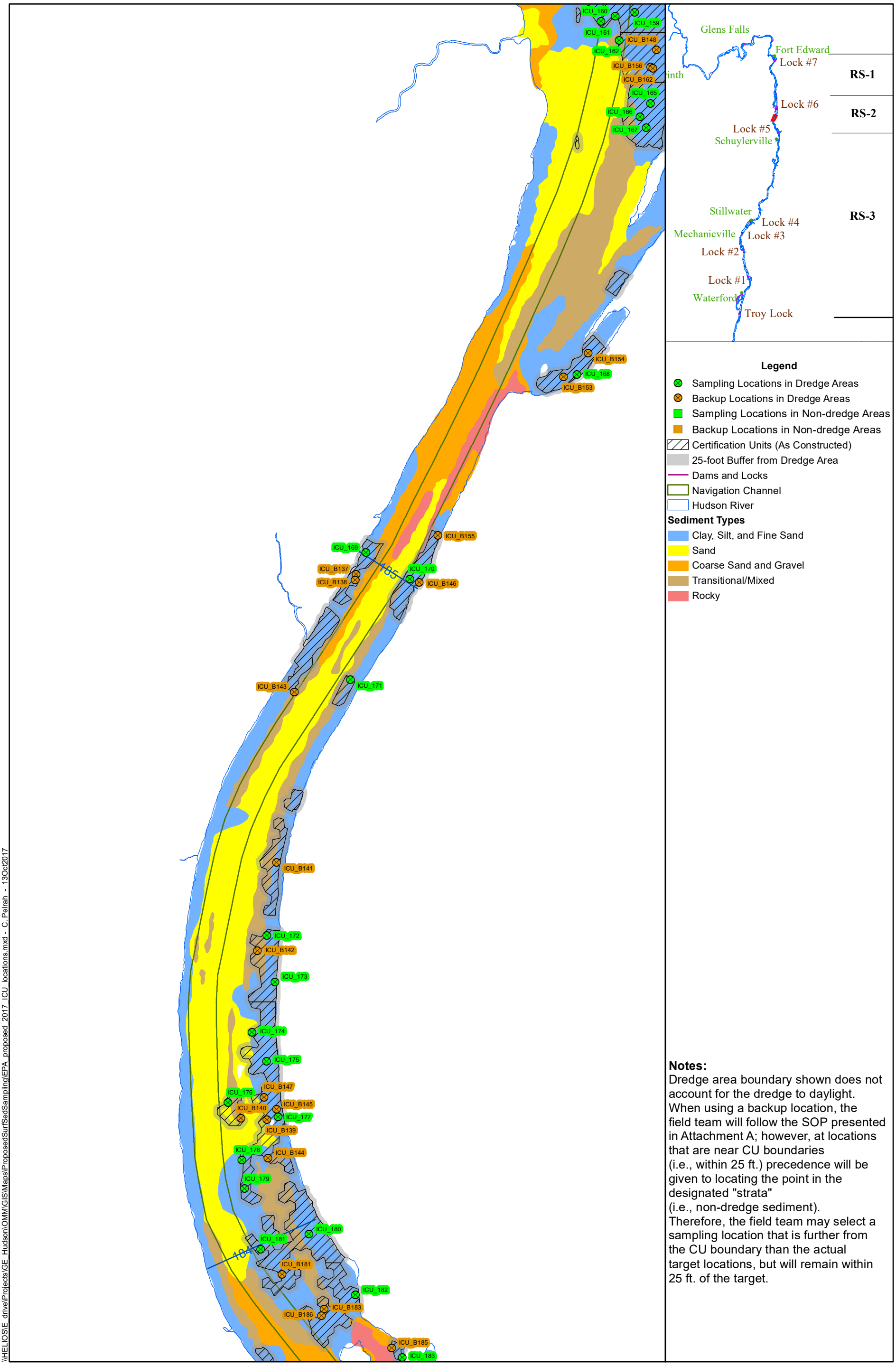
Figure A-1h
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 560 1,120

Figure A-1i
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



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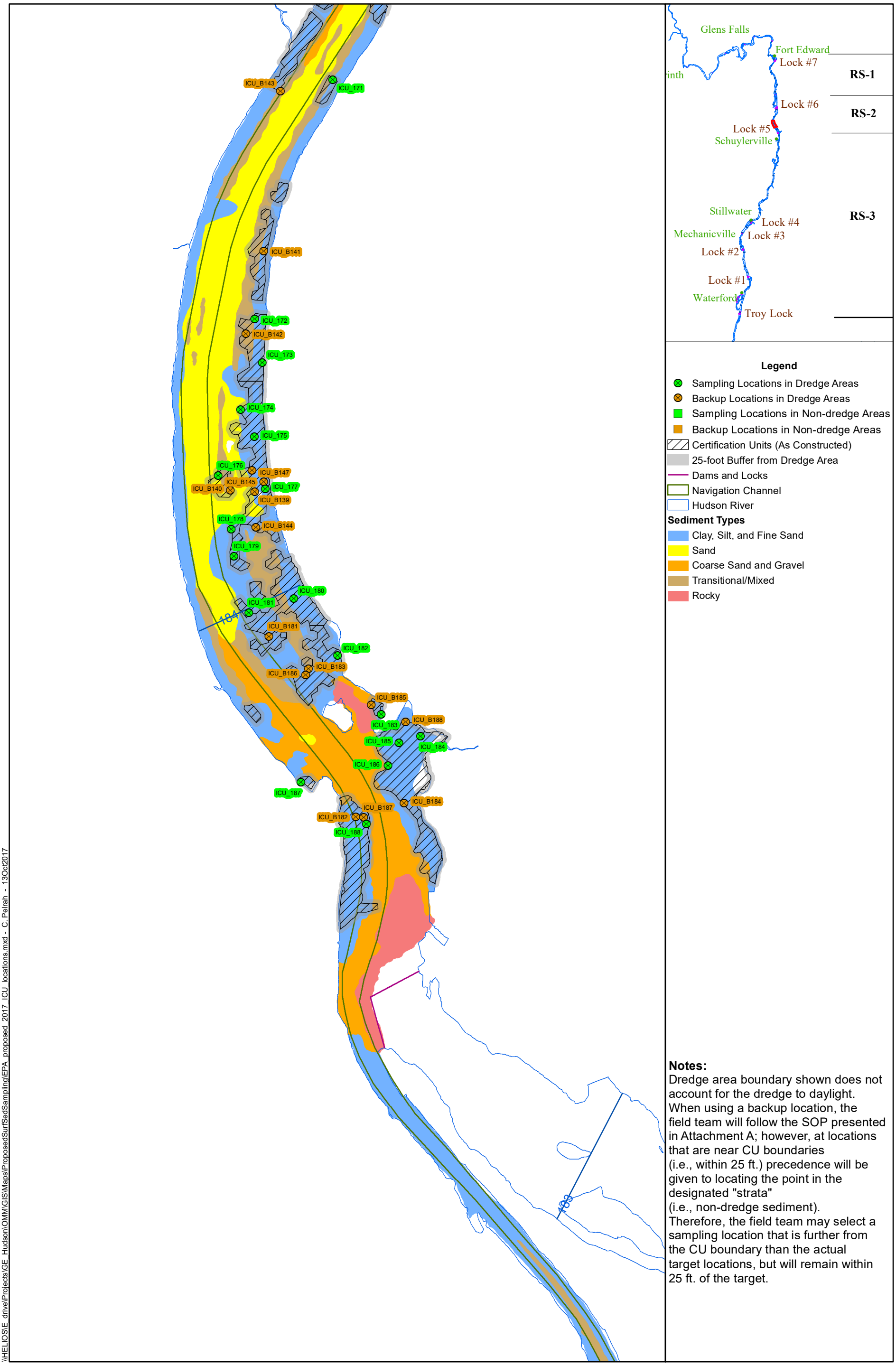
Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

ANCHOR QEA

Feet
0 720 1,440

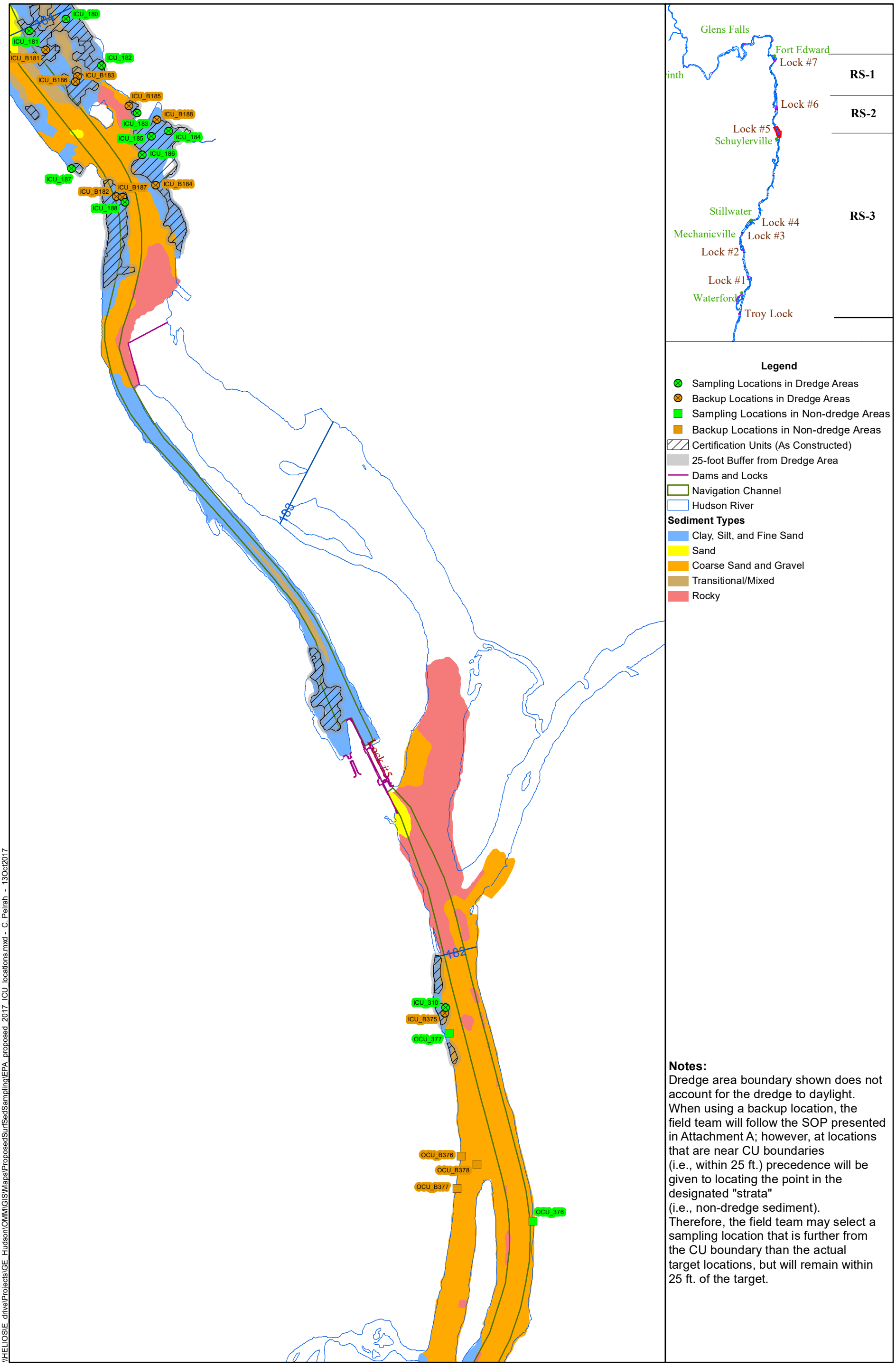
Figure A-1j
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 770 1,540

Figure A-1k
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 950 1,900

Figure A-1I
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company

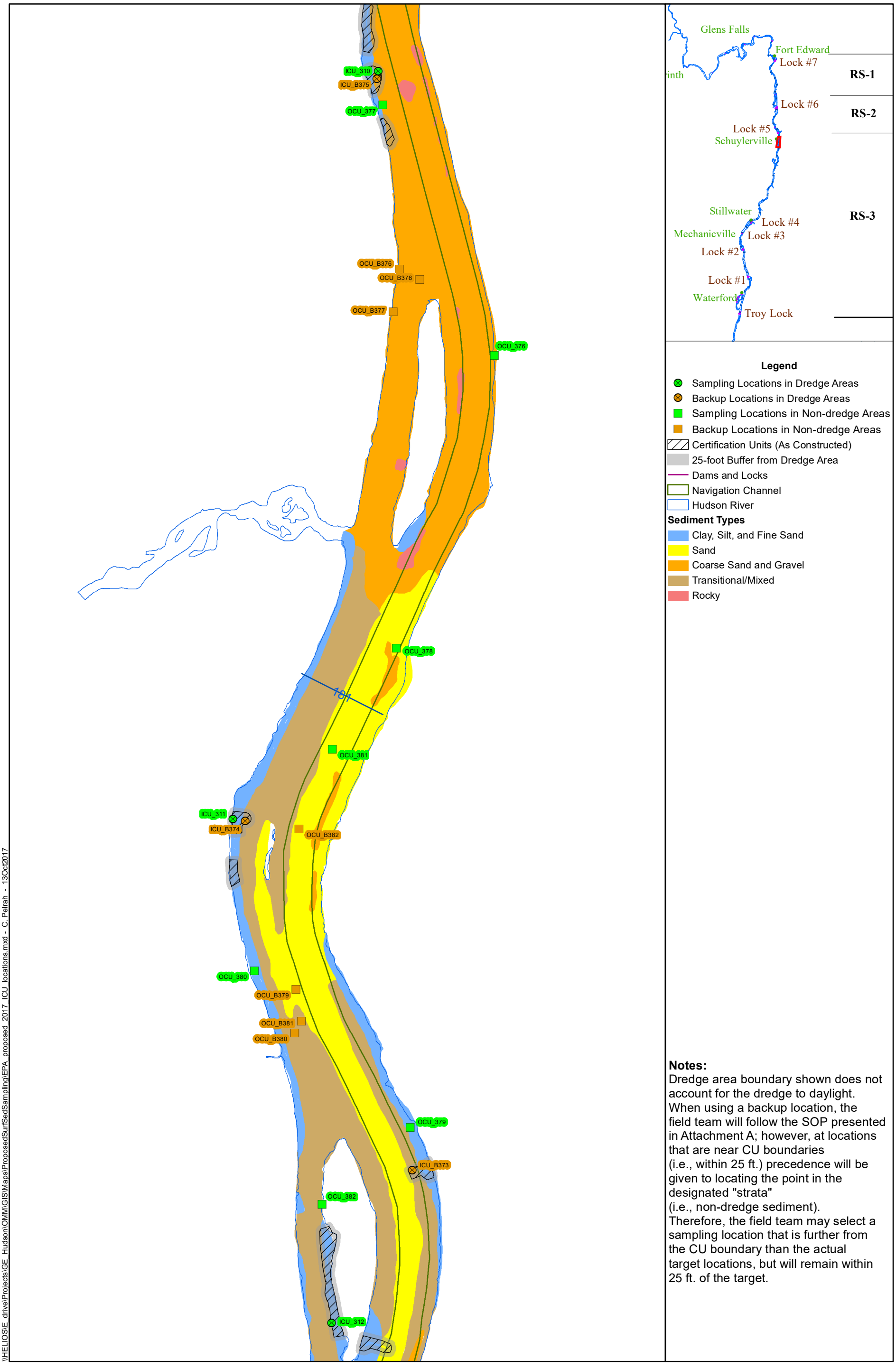
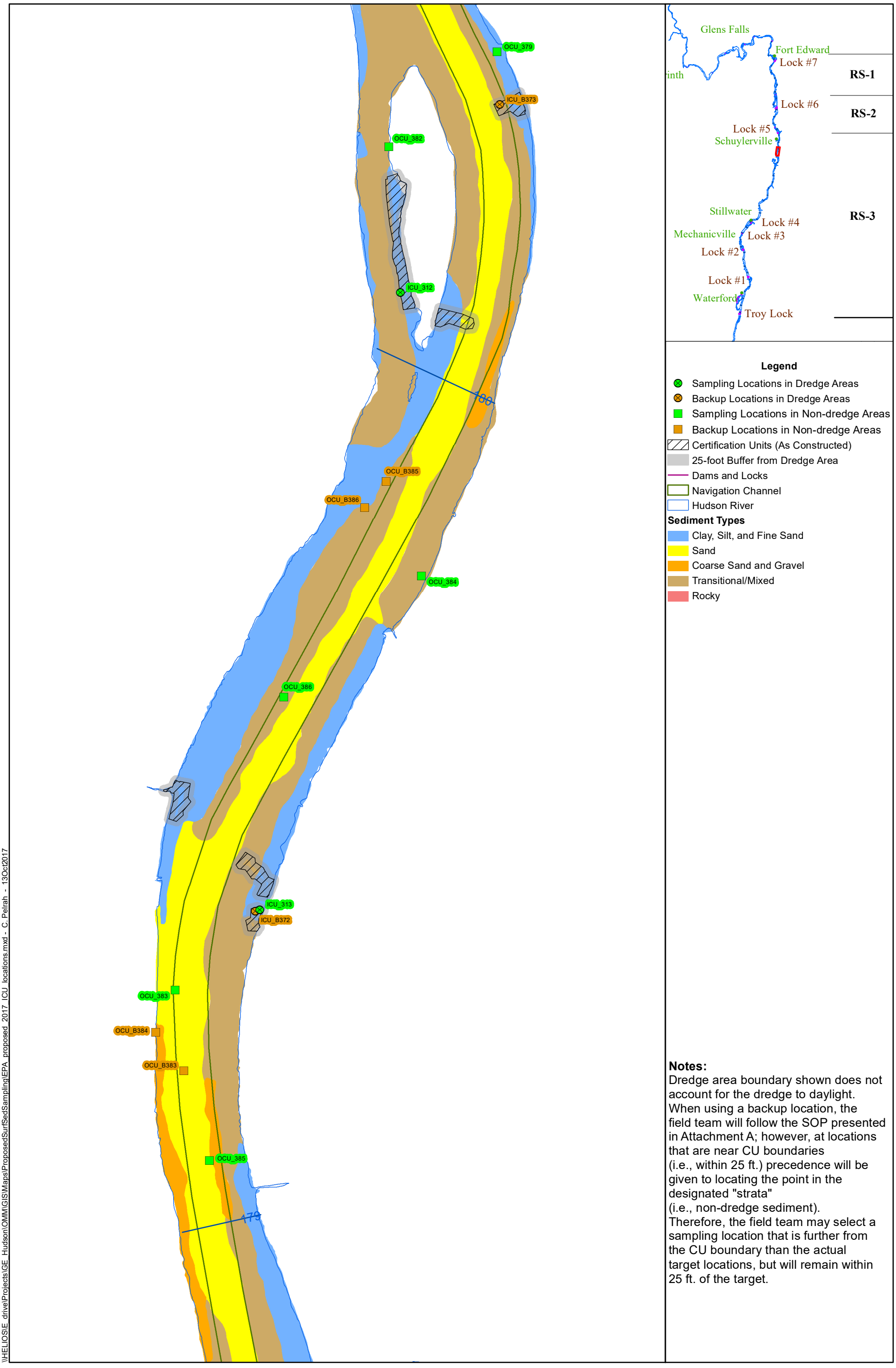


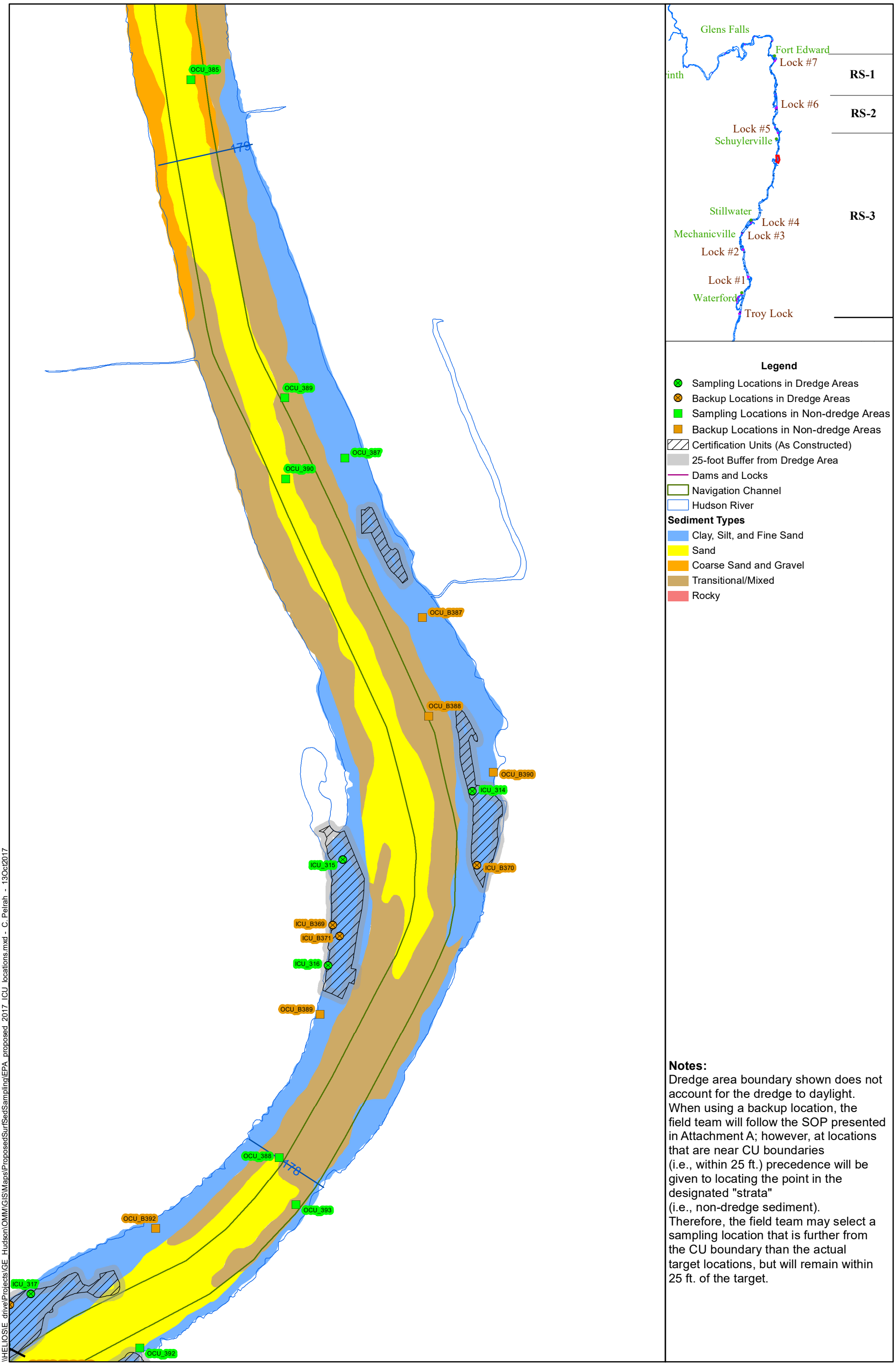
Figure A-1m
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 575 1,150

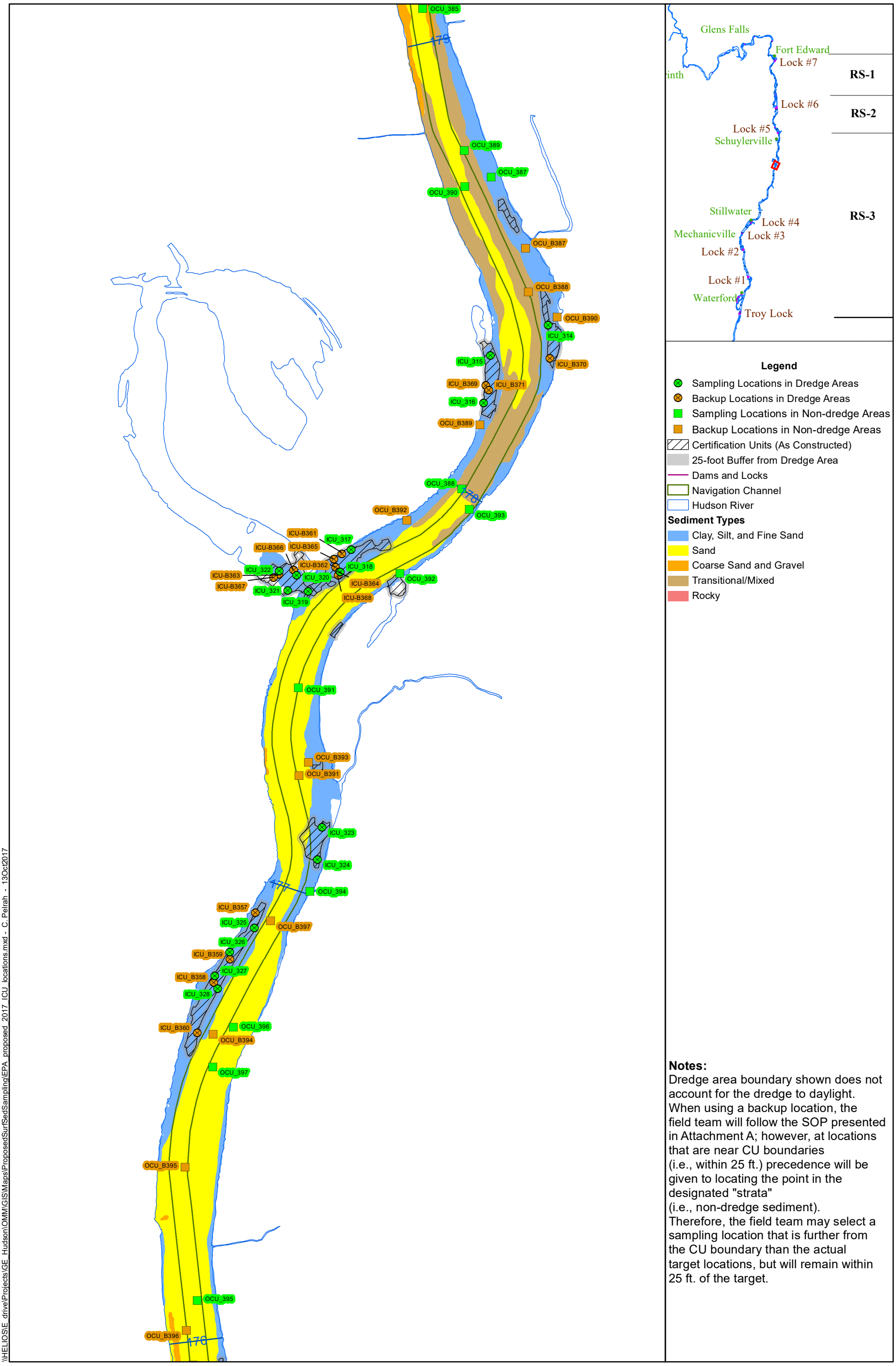
Figure A-1n
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 500 1,000

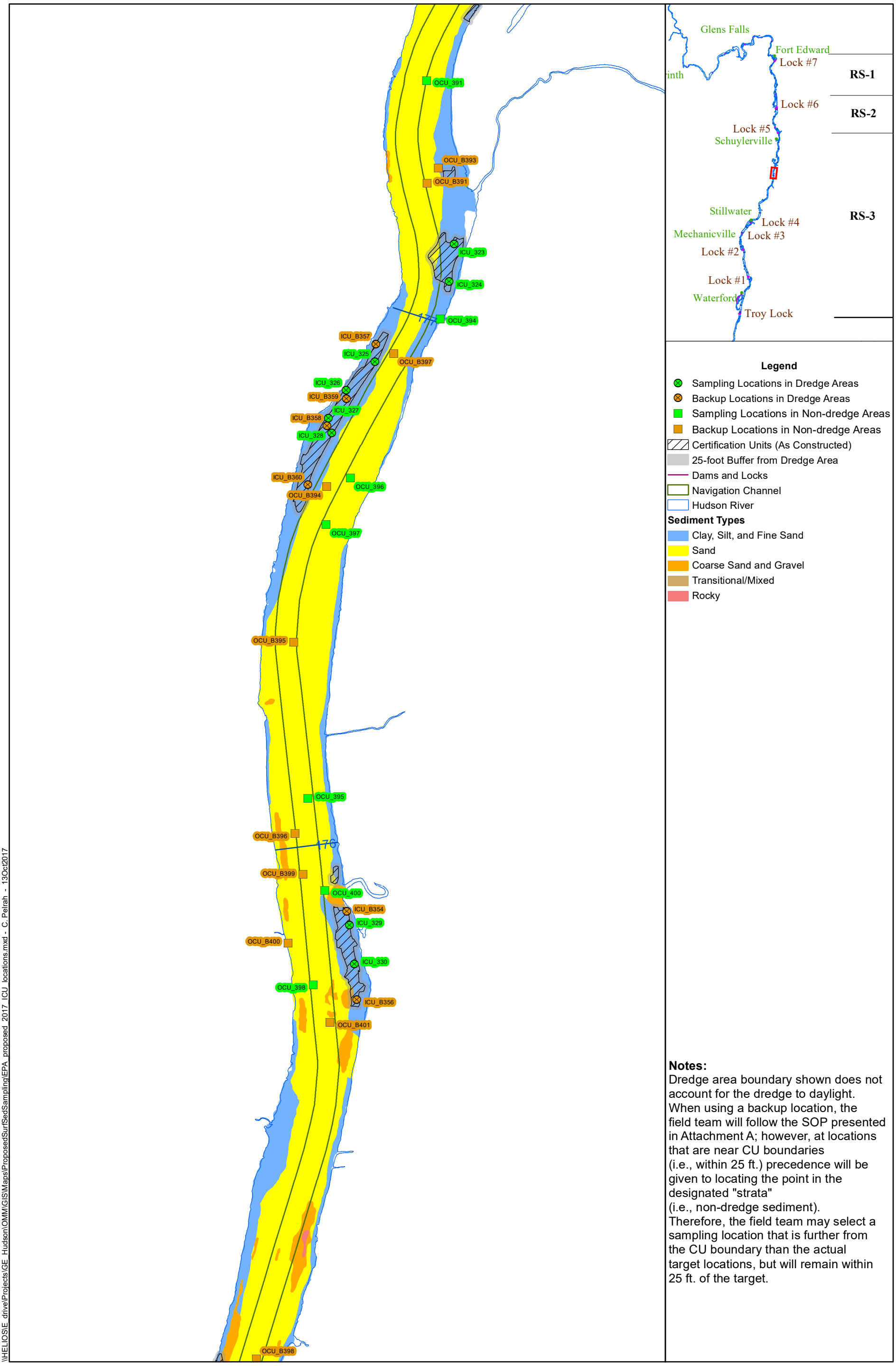
Figure A-1o
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,000 2,000

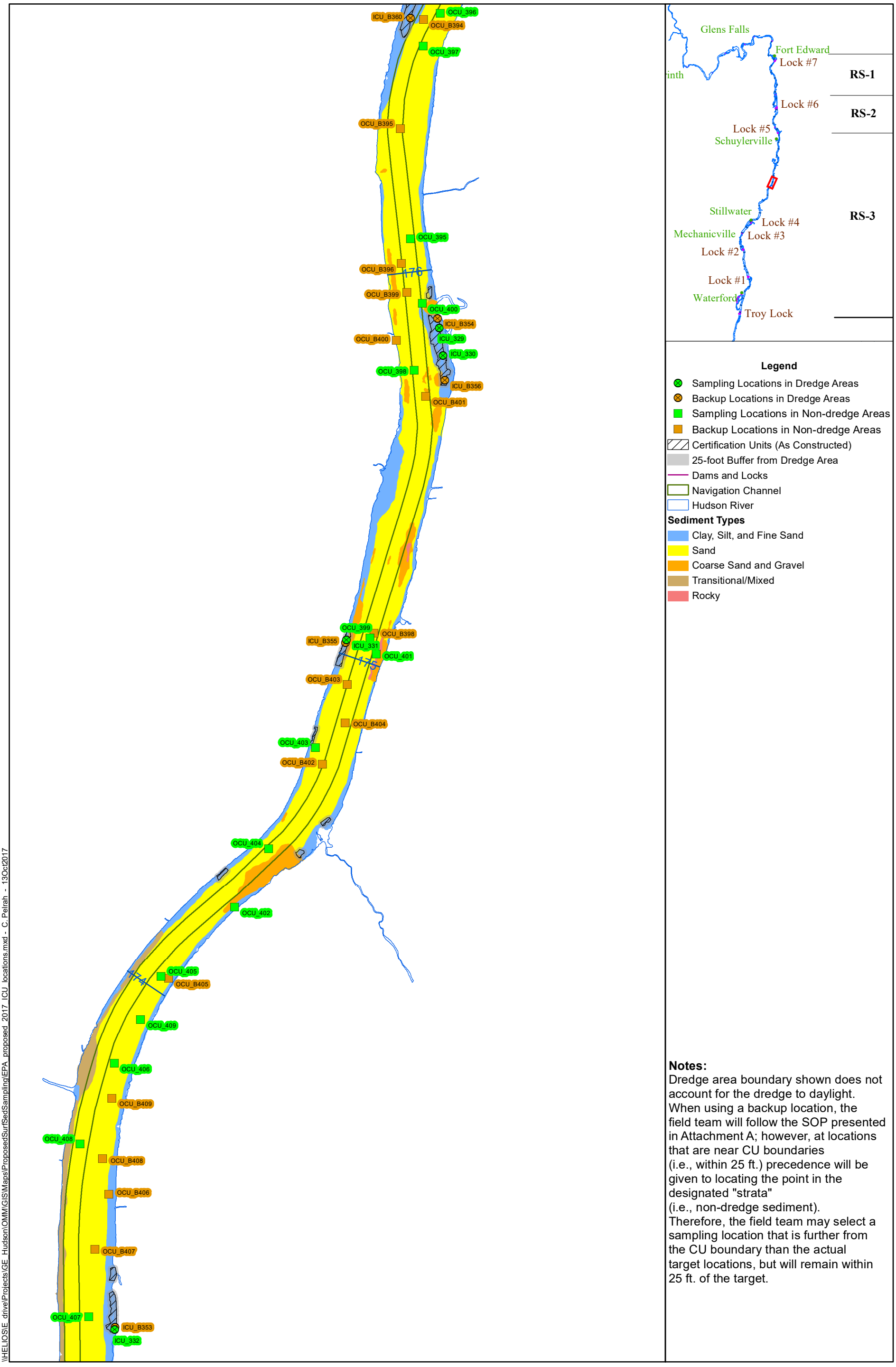
Figure A-1p
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 925 1,850

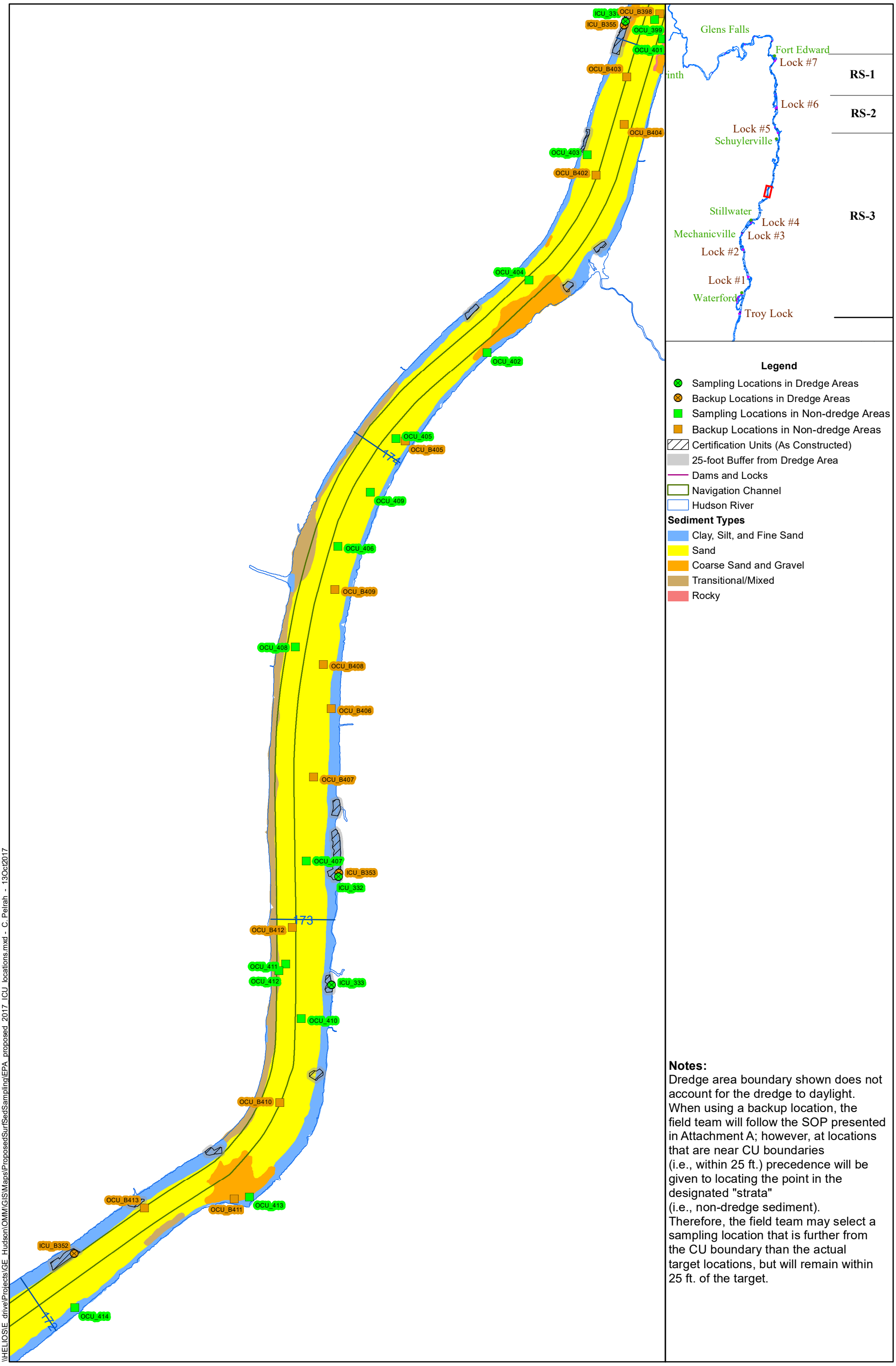
Figure A-1q
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,300 2,600

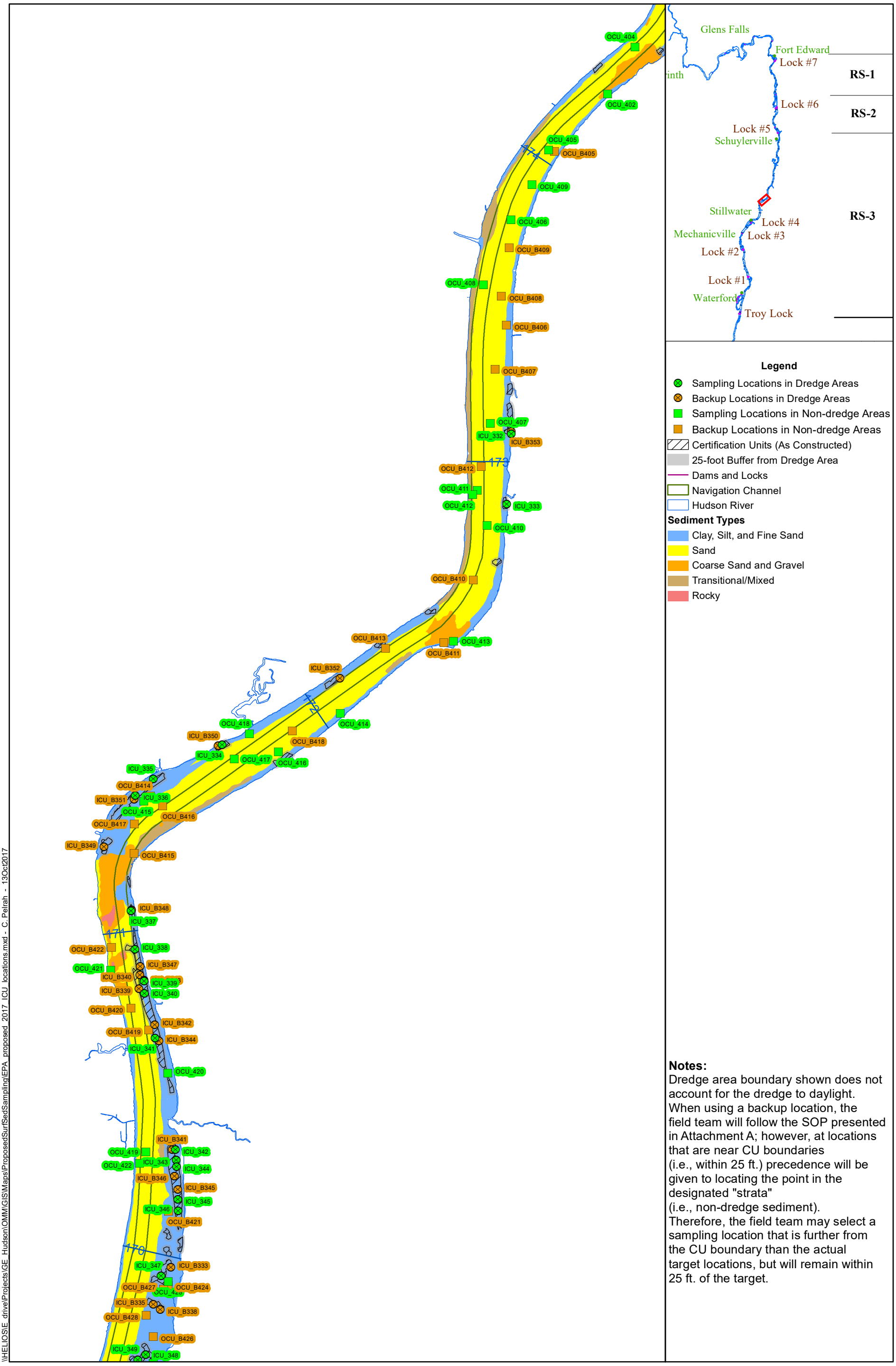
Figure A-1r
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,000 2,000

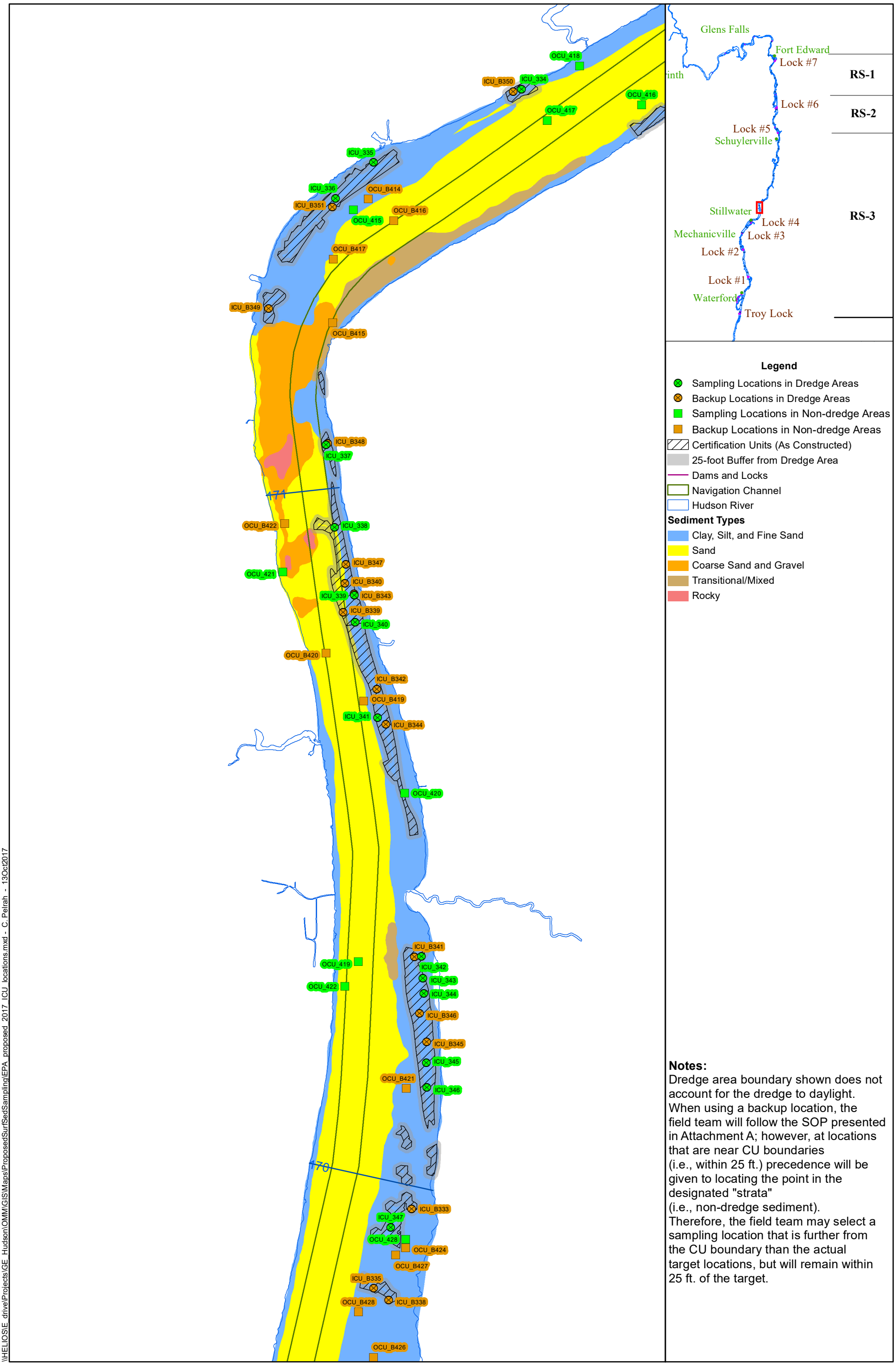
Figure A-1s
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,600 3,200

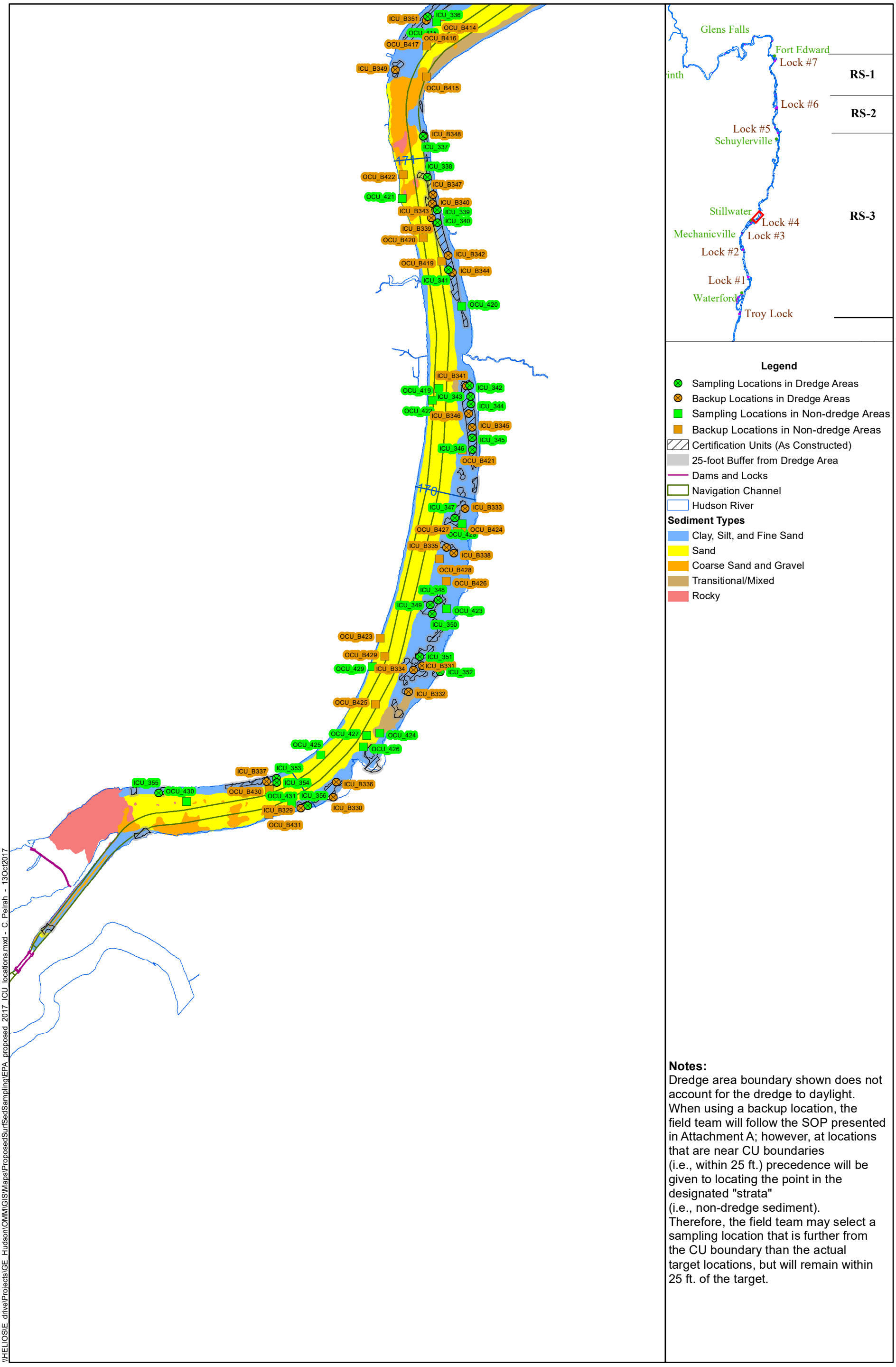
Figure A-1t
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 770 1,540

Figure A-1u
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

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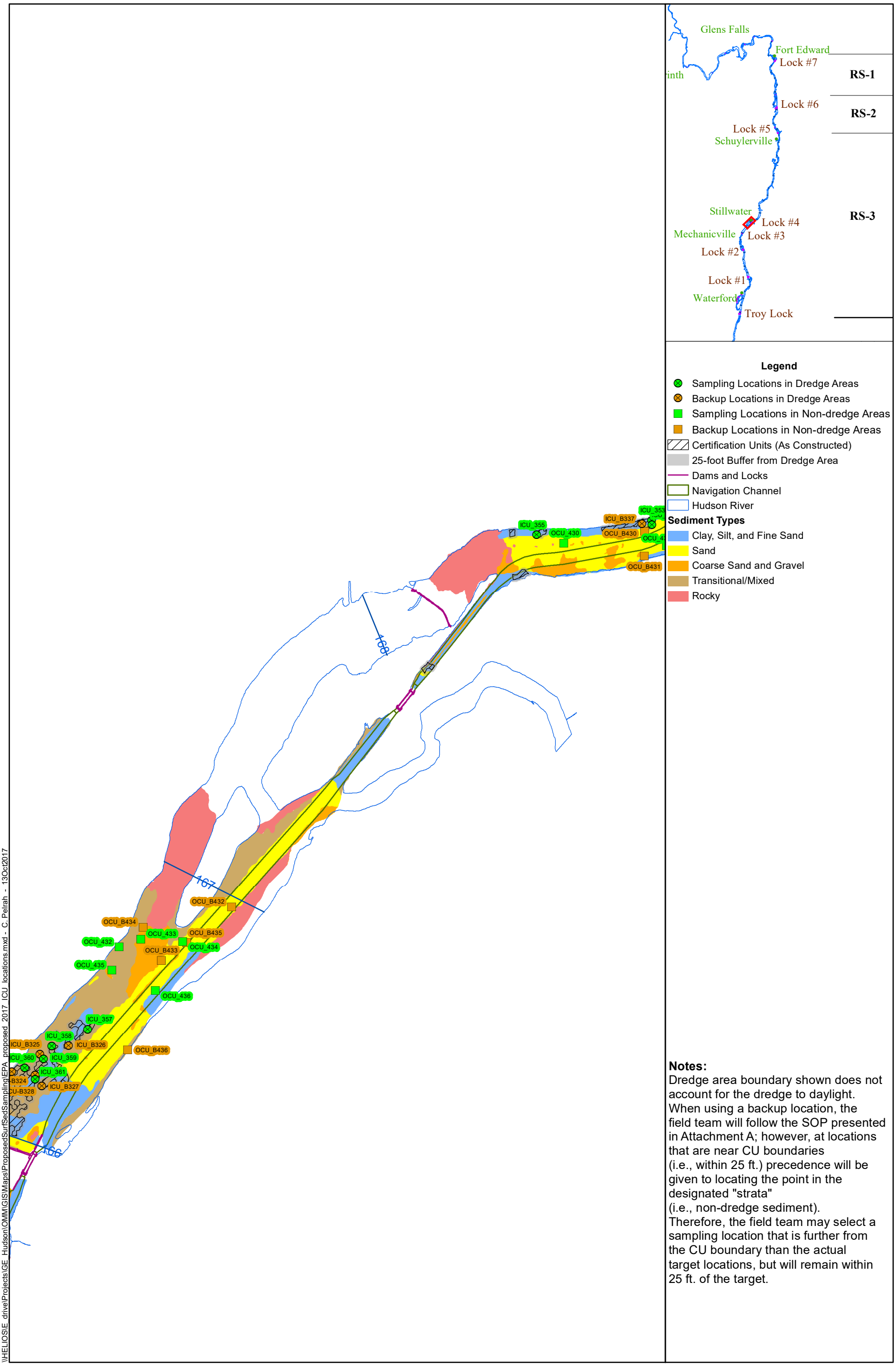
ANCHOR QEA

Feet
0 1,500 3,000

Figure A-1v
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company

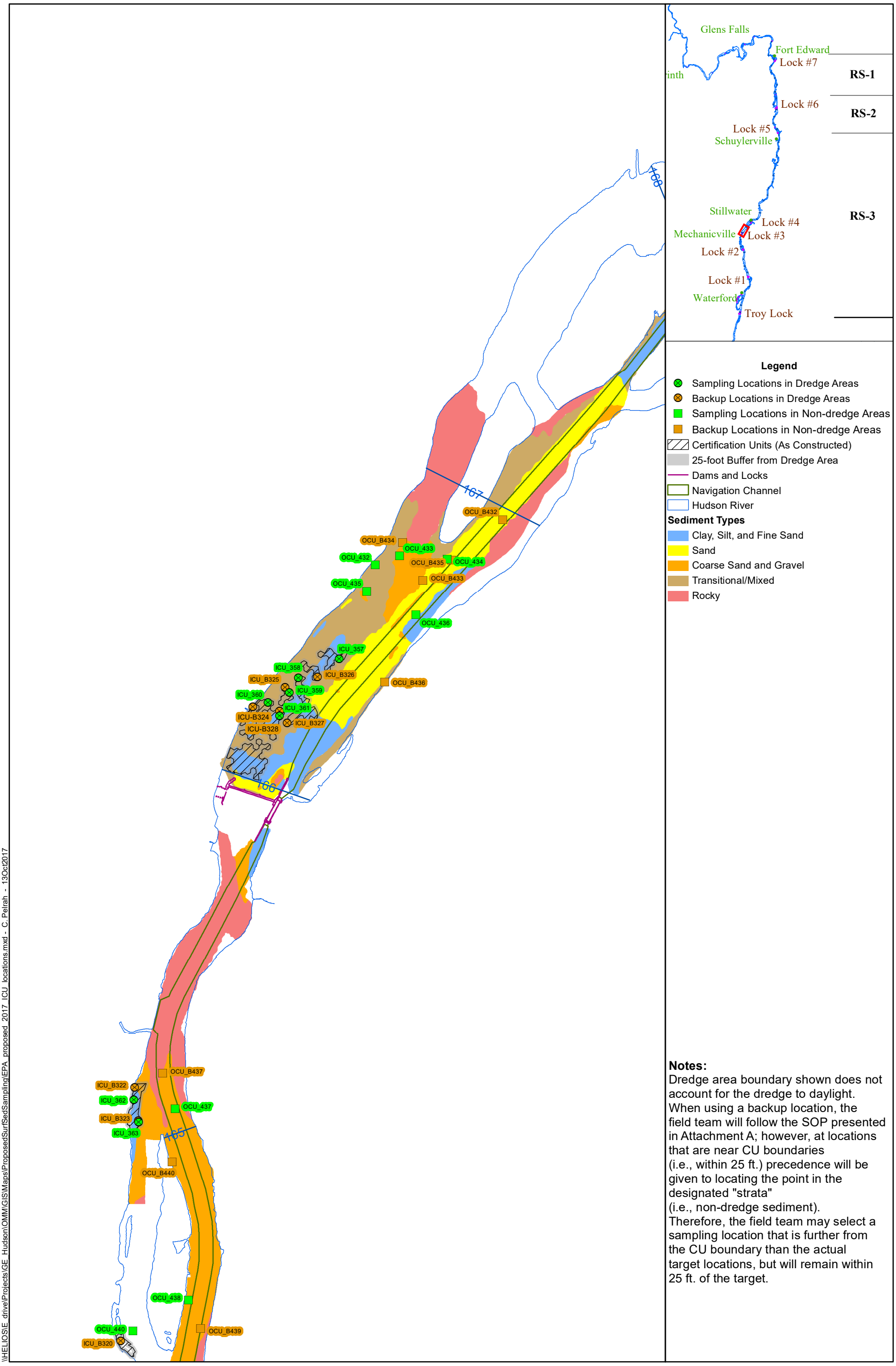


Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

ANCHOR QEA

Feet
0 1,600 3,200

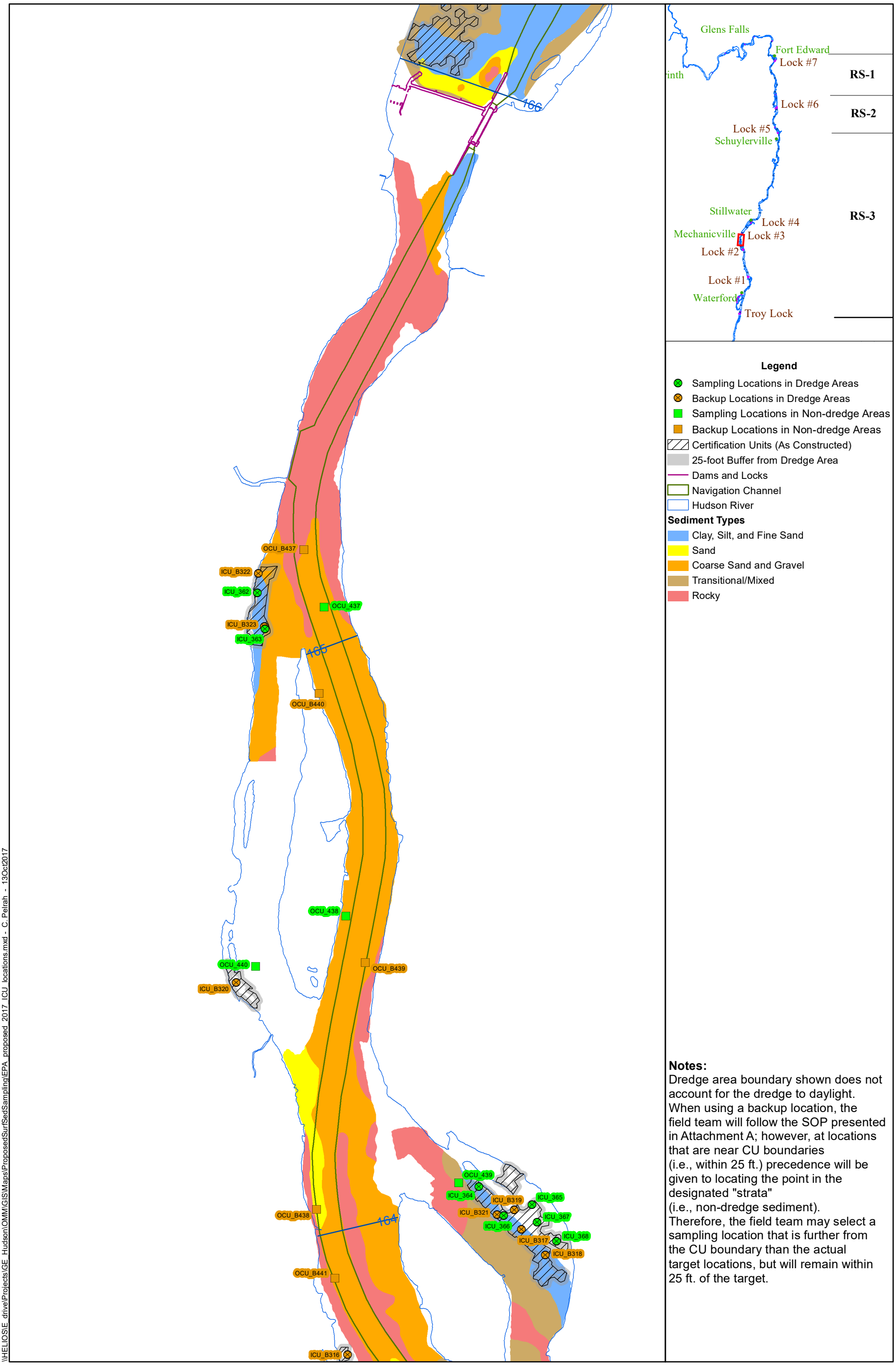
Figure A-1w
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,400 2,800

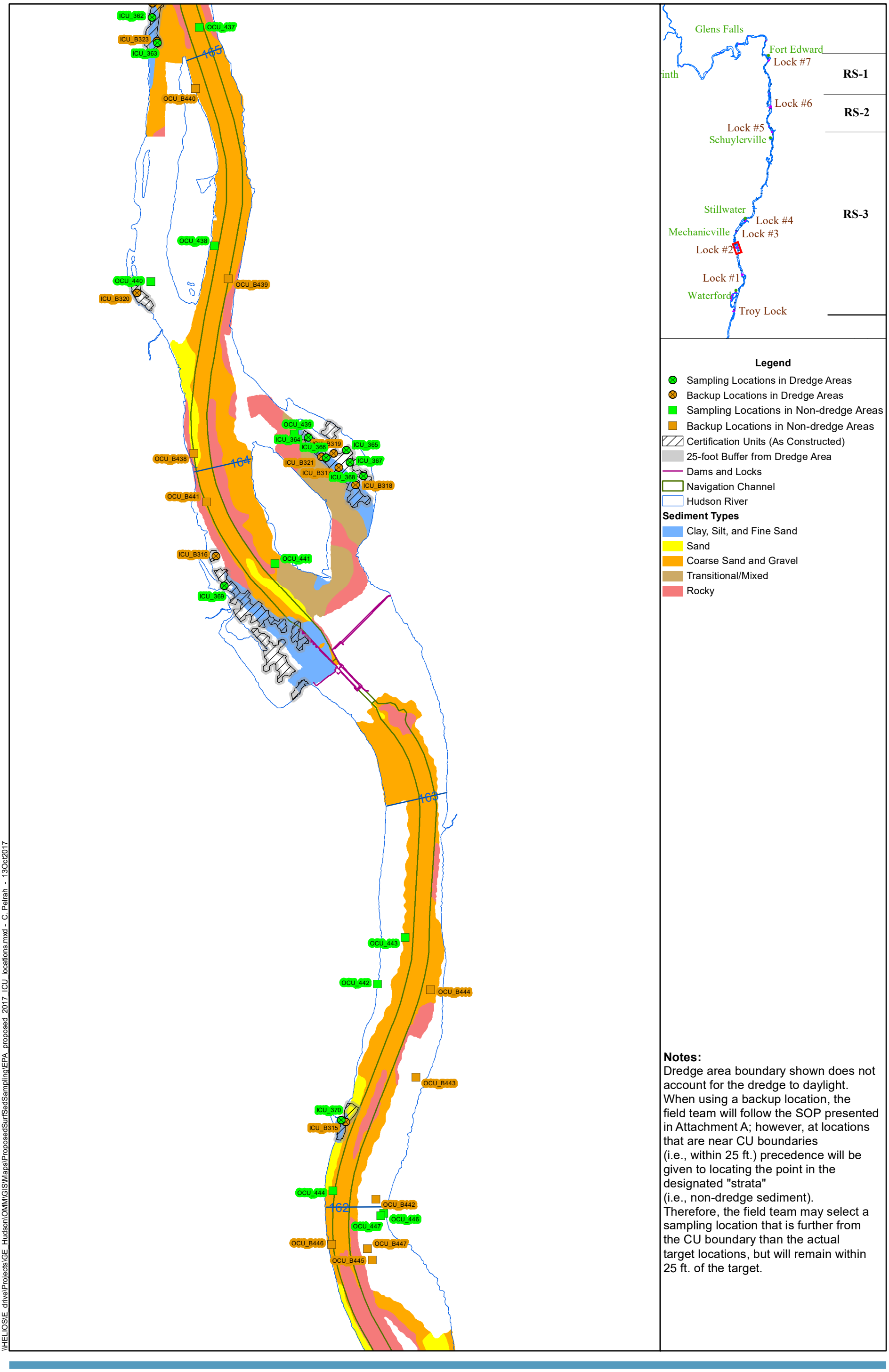
Figure A-1x
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 875 1,750

Figure A-1y
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



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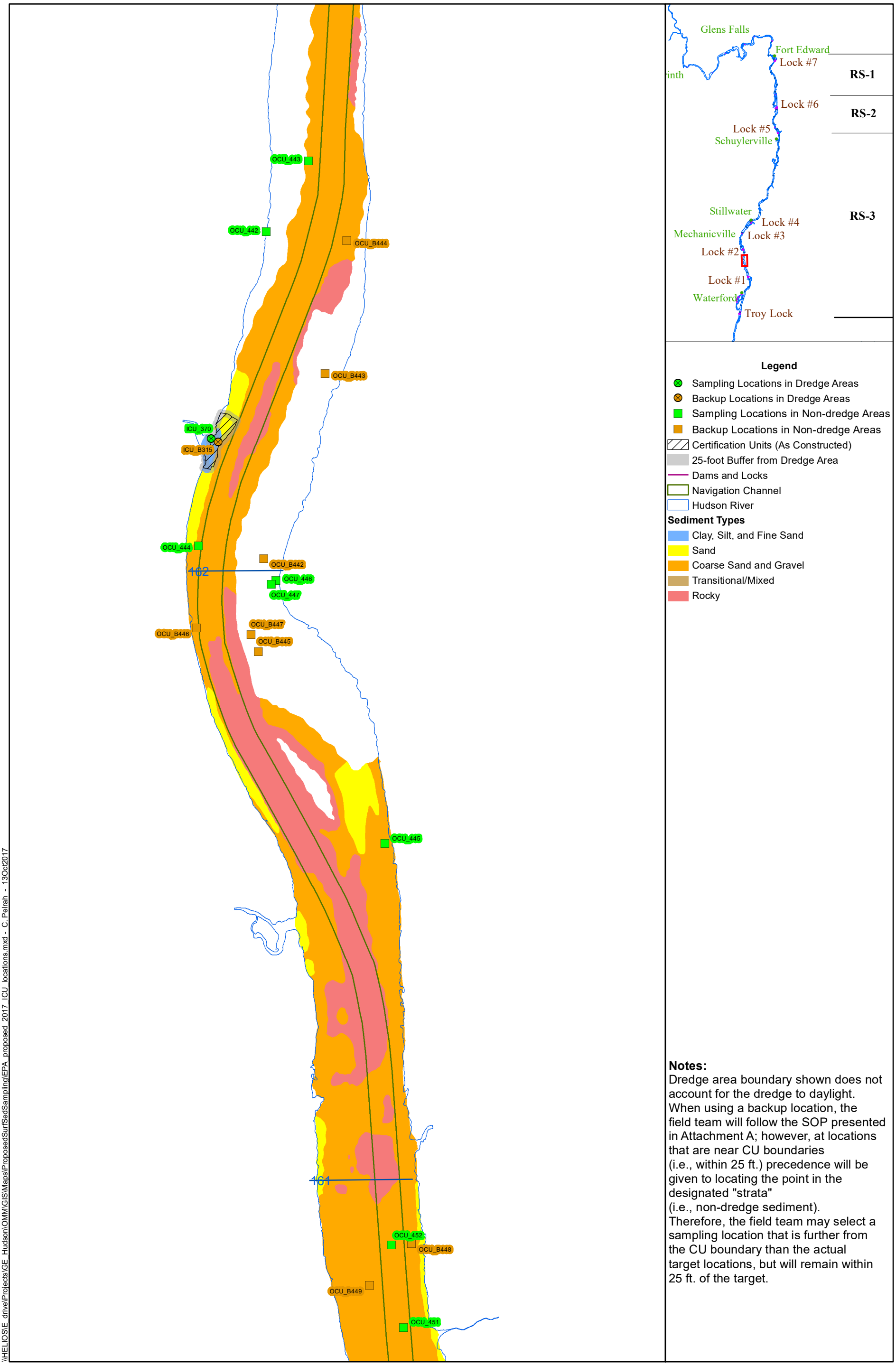
Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

ANCHOR QEA

Feet
0 1,200 2,400

Figure A-1z
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

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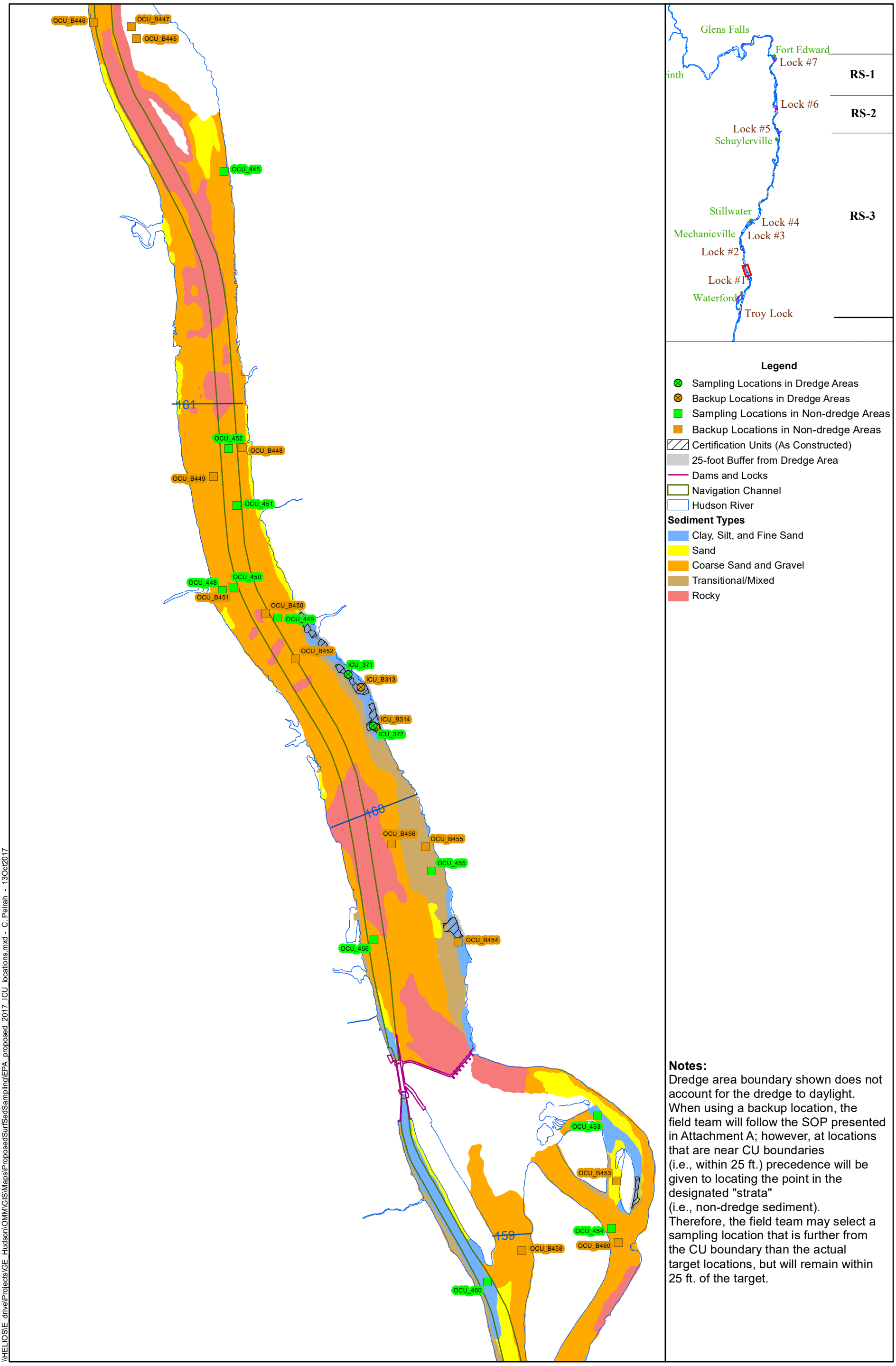
ANCHOR QEA

Feet
0 820 1,640

Figure A-1aa
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



Notes:
Dredge area boundary shown does not account for the dredge to daylight.
When using a backup location, the field team will follow the SOP presented in Attachment A; however, at locations that are near CU boundaries (i.e., within 25 ft.) precedence will be given to locating the point in the designated "strata" (i.e., non-dredge sediment). Therefore, the field team may select a sampling location that is further from the CU boundary than the actual target locations, but will remain within 25 ft. of the target.

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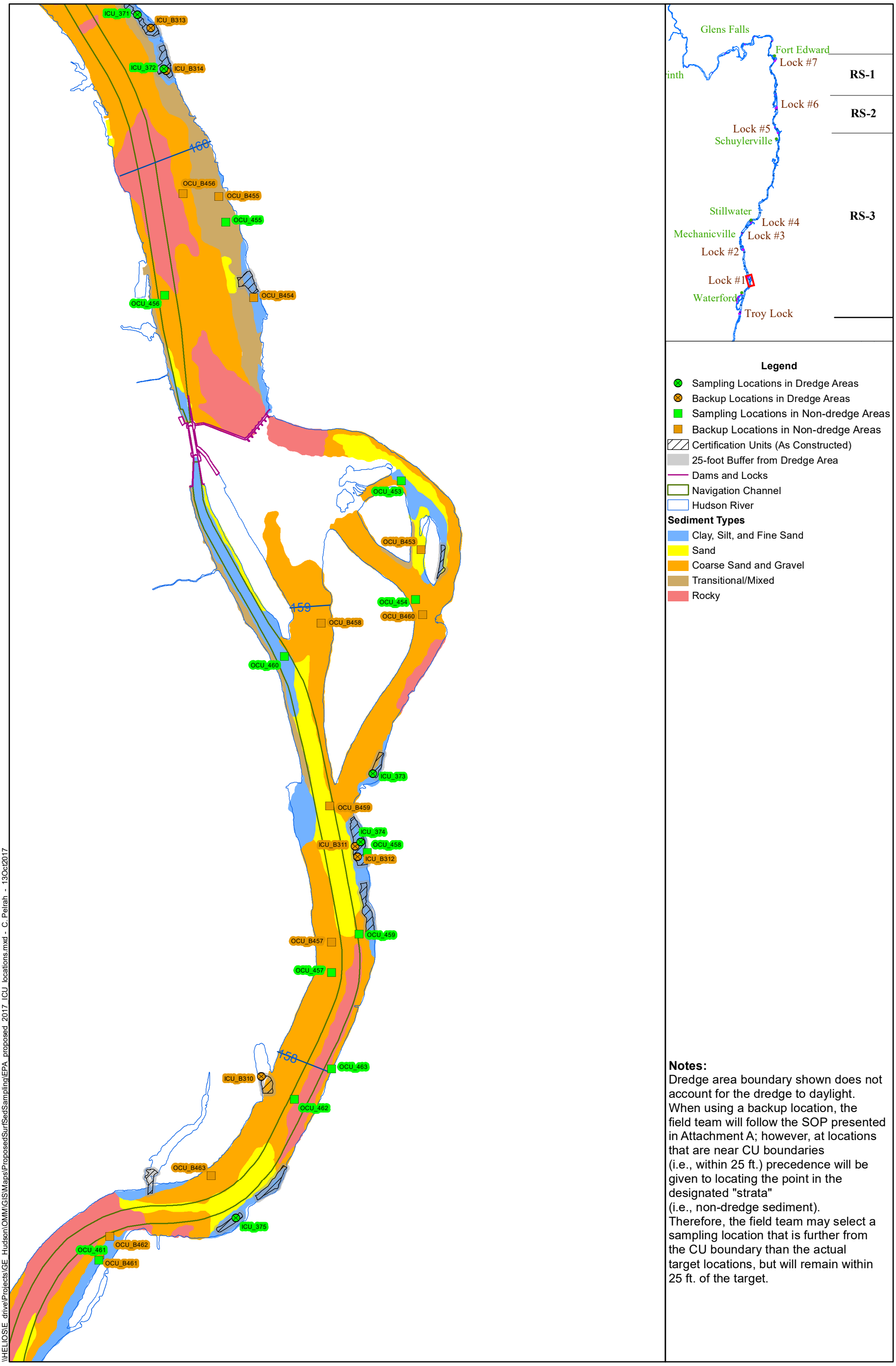
ANCHOR QEA

Feet
0 1,100 2,200

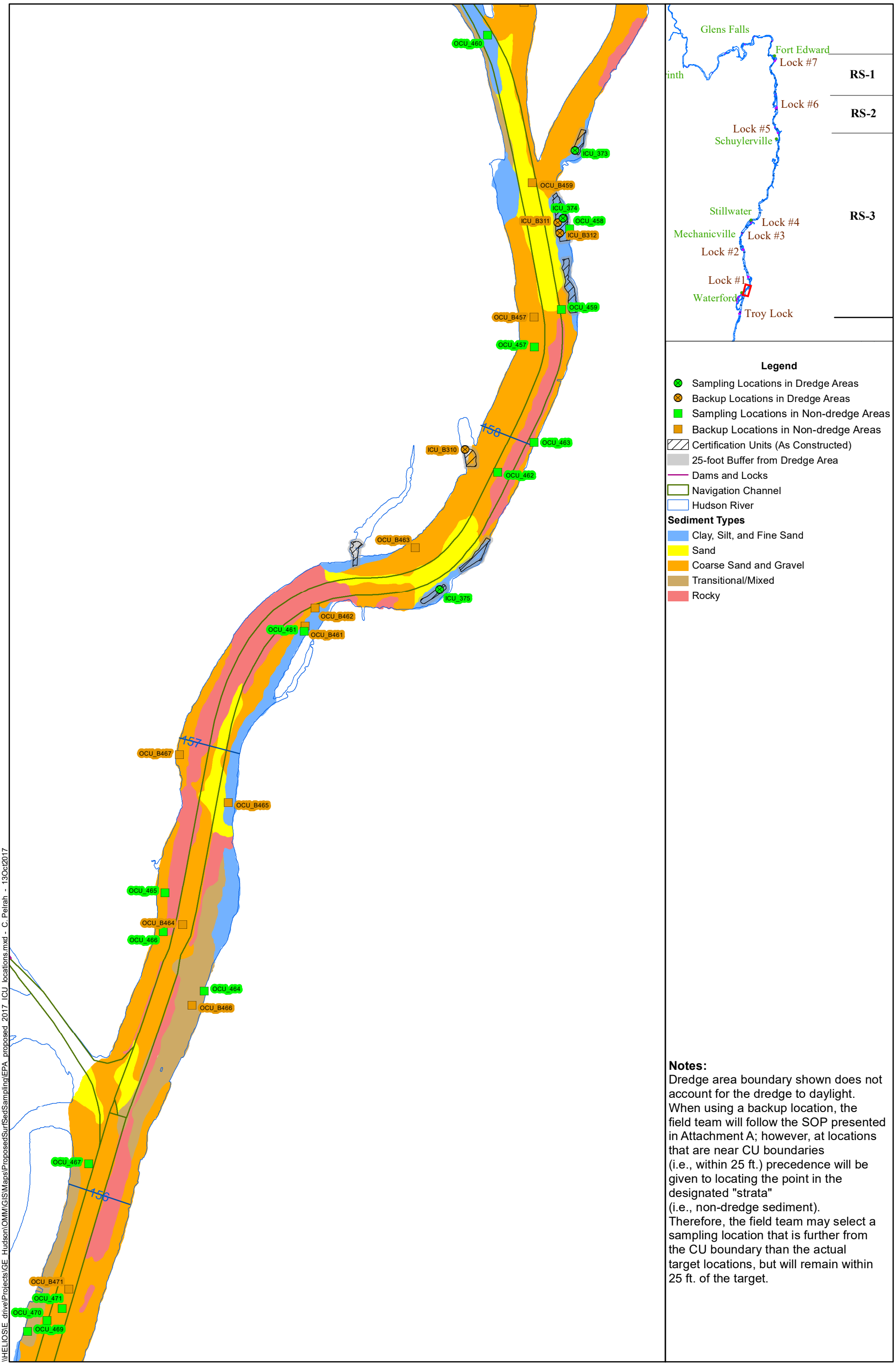
Figure A-1ab
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

0 1,100 2,200 Feet

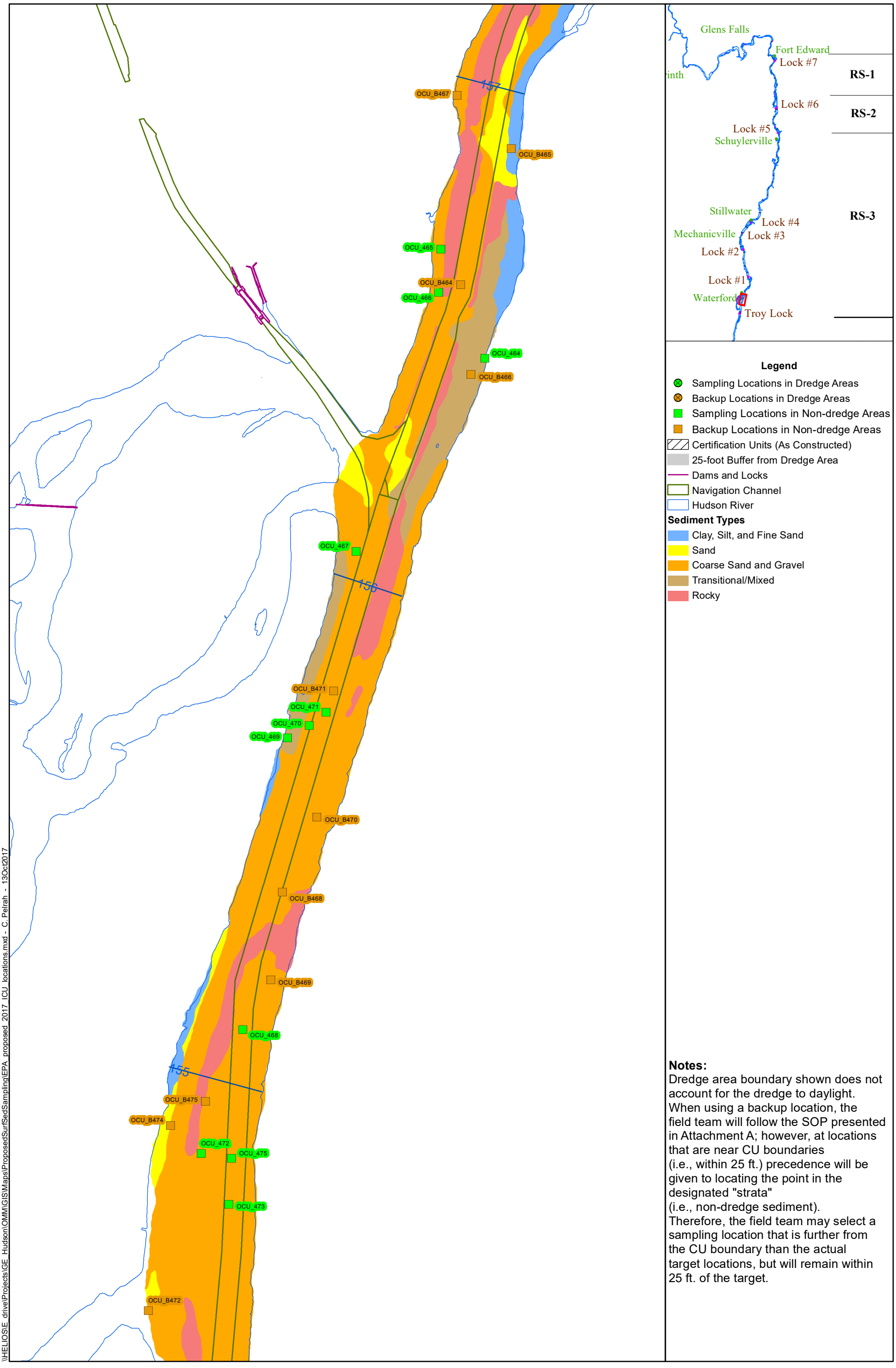
Figure A-1ac
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,100 2,200

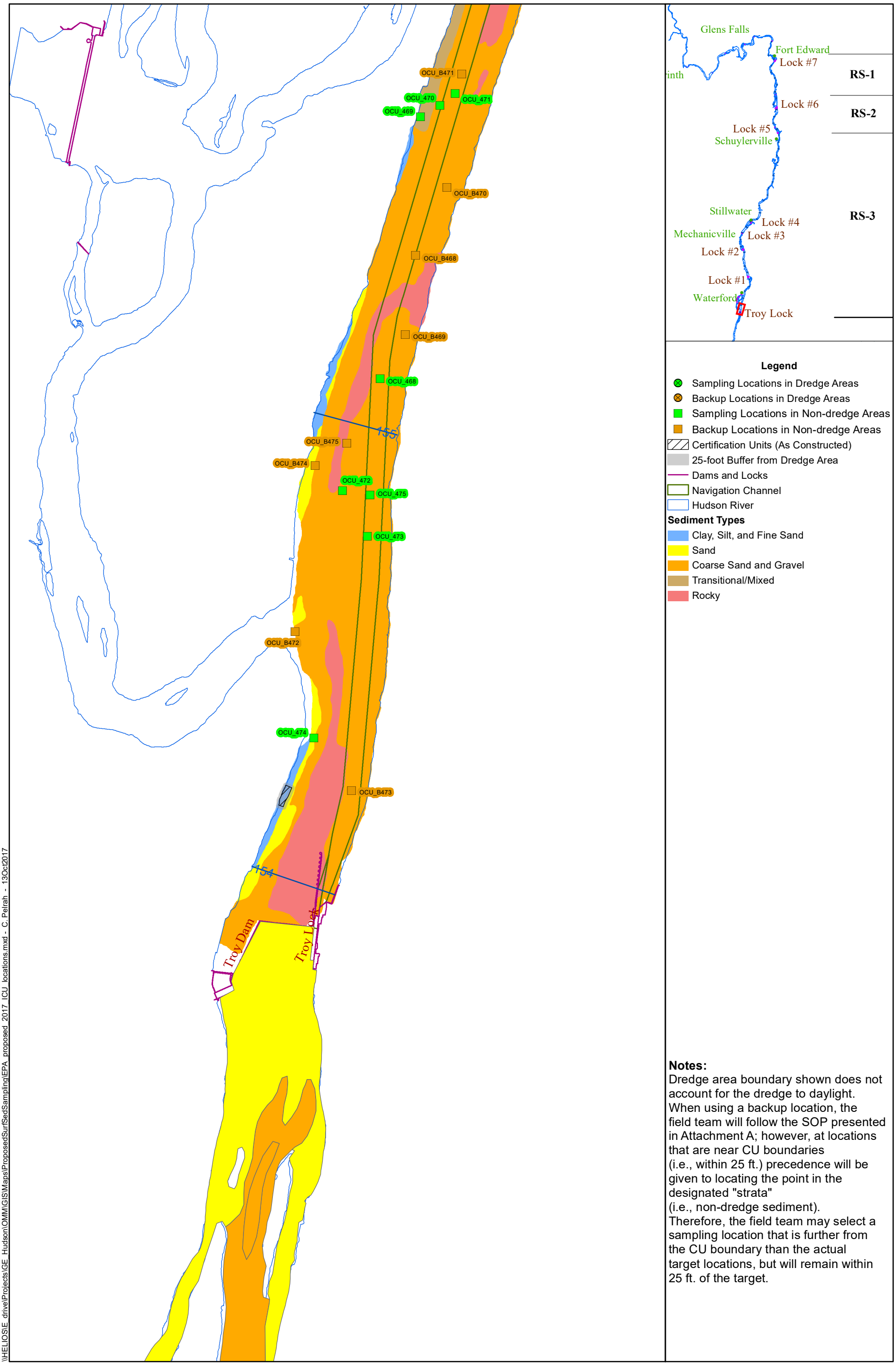
Figure A-1ad
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,000 2,000

Figure A-1ae
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company



ANCHOR QEA

Feet
0 1,100 2,200

Figure A-1af
Target Surface Sediment Sampling Locations
Addendum to Surface Sediment Sampling Work Plan for 2016
Prepared for the General Electric Company

ATTACHMENT A

STANDARD OPERATING PROCEDURE FOR SURFACE SEDIMENT SAMPLE COLLECTION

1 PROCEDURES

1.1 Scope and Application

This Standard Operating Procedure (SOP) is applicable to the collection of surface sediment samples and is based on the procedures specified in Appendix 9.3-1 of the *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan* (Phase 2 RAM QAPP; Anchor QEA and ESI 2012), with appropriate modifications for the collection of surface sediment samples in accordance with the *Addendum to Surface Sediment Sampling Work Plan for 2016* (2016 Sediment Sampling Plan Addendum).

2 SUMMARY OF METHOD

The crew will use a Differential Global Positioning System (DGPS) to navigate to the pre-determined sampling locations. The sampling vessel will be secured into place at each target location and surface samples will be collected using a Van Veen dredge equipped with a landing frame. An Ekman dredge or a Ponar dredge may be used in limited situations, only with EPA concurrence.

3 HEALTH AND SAFETY WARNINGS

Health and safety issues are addressed in the *Phase 2 Remedial Action Health and Safety Plan* (HASP; Parsons 2016).

4 CONTAMINATION AND INTERFERENCES

Potential sources of contamination and interferences during sampling include the presence of residual analytes and/or accumulation of solids on the sample collection equipment. Sampling equipment that comes into contact with sediment and will be reused will be decontaminated in the field prior to reuse according to the following procedures:

- Rinse with river water and a scrub brush to remove all visible sediment.
- Rinse with distilled water.

Other conditions that may affect the ability to collect representative samples include:

- High flows
- Deep water
- Inclement weather
- Sediment type

5 PERSONNEL QUALIFICATIONS

All field personnel are required to take a 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations (HAZWOPER) training course and annual refresher courses, and participate in a medical monitoring program prior to engaging in any field collection activities as required in 29 CFR 1910.120. Additionally, field personnel will be under the direct supervision of qualified professionals who are experienced in performing the tasks required for sample collection.

6 EQUIPMENT AND SUPPLIES

The following equipment will be used to conduct sediment sampling:

1. Sampling vessel equipped with spuds
2. Real Time Kinematic (RTK) DGPS capable of sub-meter accuracy
3. Calibrated steel rod for probing
4. Van Veen dredge with landing frame
5. Ekman dredge
6. Ponar dredge
7. 1-inch sieve
8. Personnel protective equipment (PPE) – including steel toe boots and disposable gloves (refer to HASP requirements for full PPE requirements)
9. Laptop computer and field database
10. Aluminum or plastic tubs
11. New disposable aluminum pans with lids
12. Sample transfer tools (disposable spoons or equivalent)
13. Digital camera
14. Decontamination supplies

15. Containers for holding investigation derived wastes
16. Laboratory containers, coolers, and ice
17. Tools
18. Media for preparing equipment blanks

7 SAMPLE COLLECTION

7.1 Sampling Locations

Sampling locations are presented in Section 2.1 and associated figures and tables of the 2016 Sediment Sampling Plan Addendum.

7.2 Navigation and Probing

1. Using the on-board DGPS, maneuver the sampling vessel to within 10 feet of the pre-programmed target coordinates for each sample location. At locations that are near CU boundaries (i.e., within 25 feet of such boundaries), precedence will be given to locating the point in the designated "strata" (i.e., backfill/cap material versus non-dredged sediment); therefore, the field team may select a sampling location that is further inside or outside the CU boundary than the actual target locations, but will attempt to remain within 25 feet of the target. The target coordinates will be in northing and easting format, using the North American Datum of 1983 (NAD 83). Secure the vessel in place using spuds and/or anchors.

    a. In the event that a sampling location is inaccessible due to the location being too close to shore, navigate as close to the location as water depth will allow and attempt to collect the sample. The actual sampling coordinates will be recorded in the field database.

    b. If locations are inaccessible due to shallow water or due to safety concerns in response to high flows, attempt sampling at the next available backup location within the same 1-mile river subsection (in consultation with the EPA field representative), as provided in the 2016 Sediment Sampling Plan Addendum.

    c. If a sampling location is located in an area where using spuds or anchors are not feasible (e.g., hard bottom with water depth exceeding 20 feet), sample collection may still be attempted if field conditions permit. Maintaining the

position of the boat using the engine during sampling may be possible under low flow, calm conditions.

2. Use a sharpened 0.5-inch-diameter steel rod marked in 6-inch intervals (or equivalent) to probe the sediment surface 3 to 5 feet away from the target location to determine the surficial sediment type. Advance the probe into the river bed approximately 6 to 12 inches, noting the ease of penetration and type of resistance met by the probe. Record the estimated sediment type (e.g., rock, fine-grained, coarse-grained) as the most representative one of the three attempts in the field database.
3. Identify the appropriate sampling method. At most locations, a Van Veen dredge equipped with a landing frame will be used. Sample collection with a Ponar dredge or Eckman dredge may be used in limited situations, only with EPA concurrence..

7.3 Van Veen Dredge Guidelines

The procedures for collecting a sample using a Van Veen dredge are as follows:

1. Navigate the sampling vessel to the target location and conduct probing in accordance with the procedures presented in Section 7.2.
2. Don clean nitrile gloves prior to assembling the apparatus, retrieval of the device, and when collecting the sample.
3. Decontaminate the Van Veen dredge in accordance with the procedures specified in Section 4 before each use.
4. Adjust the landing frame so that the jaws of the sampler will be 2 inches below the frame when in the closed position.
5. Lower the Van Veen dredge until the landing frame comes to rest on the river bed using an electric winch and allow approximately 1 foot of slack in the suspension cable.
6. Reverse the winch and tighten the cable, which will engage the jaws of the Van Veen dredge and collect a sediment sample.
7. Retrieve the Van Veen dredge using the electric winch and place it in an aluminum pan, plastic tub, or equivalent on the deck of the sampling vessel.

8. Empty the Van Veen into a disposable aluminum pan by pressing down on the closure arms.
9. Remove any standing water from the sample by decanting and/or using a 2- or 3-foot section of clean flexible tubing. Fill the tubing with river water, and start a siphon to remove the standing water from the aluminum pan. Pinch the tubing as needed to control the rate of discharge from the siphon tube. Be careful not to remove surface sediment.
10. Inspect the material recovered in the sampler to determine whether sufficient sediment has been recovered to allow laboratory analysis.
    a. Sufficient sediment is defined as an adequate volume of material with particle size less than approximately 1 inch to fill a sample container approximately half full (approximately 2 ounces).
    b. Stones, rock fragments, and debris that are larger than approximately 1 inch should be segregated from finer grained materials using a 1-inch sieve and not included in the sample.
11. If sufficient sediment cannot be collected after 3 attempts at a sample location, the sampling location will be abandoned and sampling will be attempted at the next available backup location within the same 1-mile river subsection, as provided in the 2016 Sediment Sampling Plan. If sufficient sediment cannot be obtained in 3 attempts at the backup sampling location, that sampling point will be abandoned, and the field crew will move on to the next primary sampling location. The information on all sediment collection attempts will be documented in the field database.
12. Describe the physical characteristics of each sample using the visual classification procedures specified in the *Design Support Sediment Sampling and Analysis Program* (ESI and QEA 2002). These characteristics will include the general soil type (i.e., fine sand, medium sand, coarse sand, gravel, silt, clay, and organic/other matter such as wood chips), presence of observable biota, odor, and color. The visual classifications will be recorded in the field database.
13. Take a photograph of the sediment collected in at each location, including any materials collected at locations that are abandoned due to insufficient sediment.

14. If the sediment type is significantly different from the sediment type anticipated based on prior sediment mapping (if any), conduct additional probing to confirm sediment texture. If the GE and EPA field teams determine that it is necessary to submit samples for quantitative grain size analysis, collect additional sample volume (if needed) with the Van Veen sampler, as described in Step 15 below.
15. One sample should be sufficient to provide the analytical volume requirements. If additional sediment is needed, collect up to two additional sediment grabs to obtain sufficient material to fulfill the analytical requirements, taking care to relocate the sampler within 3 to 4 feet of the original location. Place the contents of each subsequent grab sample in the aluminum pan in accordance with Step 8 above. Record the number of additional attempts required. Use a disposable spoon to thoroughly homogenize the sample. The following method should be followed to assure that the sample is thoroughly mixed (based on ASTM method D6051 - 96(2006) Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities):
    a. Mix the entire sample in the pan for 15 seconds.
    b. Divide the sample into quarters in the pan.
    c. Mix each quarter for 15 seconds, or longer if necessary.
    d. Combine opposite quarters (i.e., 1 and 3, and then 2 and 4) and mix each of these half samples for 15 seconds each.
    e. Combine each of these halves and mix the final single pile for 15 seconds.
    f. The sample should have the appearance of a thoroughly mixed and homogenized sample with no streaks, dark spots, or granular inconsistency. If any of these are observed, increase the mixing time for each of the steps above.
16. Transfer the homogenized sediment into sample containers appropriate for the analyses requested.
17. Unused sediment will be returned to the river after sample collection at that location is complete.
18. Data from the surface sediment sample collection will be recorded in the field database using a laptop computer on the sampling vessel. Upon completion of

sampling at one location, the field data will be entered into the database, as described in Section 9.

7.4 Ekman Dredge Guidelines

1. Don clean nitrile gloves prior to assembling the apparatus, retrieval of the device, and when collecting the sample.
2. Attach the mounting brackets and extension rod securely to the Ekman dredge using the bolts provided for this purpose.
3. Decontaminate the Ekman dredge in accordance with the procedures specified in Section 4 before each use.
4. Release the spring wires from around the jaw pins on the side of the dredge. This will keep the dredge from accidentally closing, possibly causing finger or hand injury.
5. Cock the Ekman. To do this, attach the springs to both sides of the jaws. Fix the jaws so that they are in the fully opened position by placing the trip cables over the release studs located near the base of the extension handle. Ensure that the hinged doors on the dredge top are free to open. Note: The top screen provided with the Ekman dredge should not be installed, however, the two top doors need to remain attached as is.
6. Prior to deploying the Ekman dredge, probe the sediment surface near, but not at, the location where the dredge will positioned, using the procedures specified in Step 2 of Section 7.2. Take caution to not disturb the sediment near the location to be sampled or to allow the river current to redeposit this material at the sampling location.
7. Determine the approximate water depth using an electronic depth finder, or from the probing exercise. Attach sufficient extension rods to the dredge as the dredge is being deployed. Minimize overhead hazards by minimizing the length of rod above the personnel. Be aware of electrical overhead hazards and do not sample near them.
8. Lower the sampler so that the sediment surface is gently contacted. In deeper water, attach sufficient lengths of pipe extension including internal triggering rod to accommodate positioning of the sampler. Do not use a rope or cable since maintaining a vertical orientation of the dredge may not be possible, or known. In

river currents that make it difficult to maintain a vertical orientation of the sampler, use a holder mounted to the boat that will permit maintaining proper orientation. A holder may be as simple as mounting a 2-inch by 6-inch vertical board and attaching two 3-foot by 2-inch by 2-inch posts creating a channel to stabilize the Ekman extensions. U-bolts, or other similar devices, can then be used to hold the extension pipe within the channel as the sampler is being deployed.

9. Once contact with the bottom is made, determine where 4 to 5 inches above the water is on the extension rod. Firmly and deliberately push the sampler into the sediment making sure not to exceed the 5-inch mark. Note: The box of the Ekman dredge has a maximum length of 6 inches. Approaching or exceeding this height will jeopardize the retention of the very fine surface sediments. If the box is overtopped, or if after retrieval fines appear to have been lost, dispose of this sample by returning it to the river, a few feet downstream of the sampling location; rinse the sampler with river water, and reattempt retrieval.
10. Trigger the jaw release mechanism by depressing the button or inner rod on the upper/exposed end of the extension handle. It may be necessary to tap the end with a hammer to get the triggering mechanism to release.
11. Slowly raise the sampler while maintaining the dredge in a vertical orientation. If necessary, carefully remove excess extension handles so that they do not pose a safety hazard. Jerking or tipping motions or excessive speed upon retrieval may disturb the sample.
12. Place the Ekman dredge in an aluminum pan, plastic tub, or equivalent on the deck of the sampling vessel. While maintaining the sample in a vertical position: open the top doors of the dredge.
13. Follow Steps 9 through 19 in Section 7.3 above.

7.5 Ponar Dredge Guidelines

1. Attach a rope or steel cable to the ring provided on top of the dredge.
2. Arrange the Ponar dredge with the jaws in the open position, set the trip bar so the sampler remains open when lifted from the top. If the dredge is so equipped, place the spring loaded pin into the aligned holes in the trip bar.
3. Slowly lower the sampler to a point approximately 2 inches above the sediment.
4. Drop the sampler to the sediment. Slack on the line will release the trip bar or spring loaded pin; pull up sharply on the line to close the dredge.
5. Place the Ponar dredge in an aluminum pan, plastic tub, or equivalent on the deck of the sampling vessel. While maintaining the sample in a vertical position: open the top doors of the dredge. Care should be taken to retain the fine sediment fraction during this operation.
6. Maintain the vertical orientation of the sample while in the dredge. Document the condition of the sample surface and discard any sample retrieved that has overtopped the dredge, or is sloped indicating that the dredge may have been on its side when closed.
7. Follow the procedures specified in Steps 9 through 19 in Section 7.3 above.

8 SAMPLE HANDLING AND PRESERVATION

Sample containers will be labeled in accordance with labeling requirements specified in Section 10.1 of the Phase 2 RAM QAPP. Samples will be collected and placed in containers in accordance with the procedures described above. Each container will be placed in a resealable food storage bag and placed in a cooler. The samples will be chilled with ice to approximately 4 °C.

The samples will be transported to the analytical laboratory as soon as practicable after collection. A temperature blank will be placed in each cooler for use by the laboratory to measure the temperature of samples upon submittal. Chain-of-custody procedures will be followed, as specified in Section 10.1 of the Phase 2 RAM QAPP.

9 DATA AND RECORDS MANAGEMENT

All data from sample collection will be recorded in the field database using a laptop computer. Upon completion of sampling at one location, all data from the location will be entered into the database. Blank field log sheets can also be used to record information manually in case difficulties with data entry using the computer are encountered. Manually recorded data will be transcribed into the field database at the end of each day.

10 QUALITY ASSURANCE AND QUALITY CONTROL

Field quality assurance/quality control (QA/QC) samples will include blind duplicate samples and equipment blank samples. One set of QA/QC samples will be collected at the rate of one per twenty environmental samples. Blind duplicate samples will be prepared by filling additional appropriately marked containers. After collection, QA/QC samples will be handled in a manner that is consistent with all other environmental samples. Equipment blanks will be prepared in the field by processing a sample of clean sand in the same manner that environmental samples are processed, including placing sand in the sample collection device, transfer the sand to a new disposable aluminum pan with a clean sample removal tool, mix the sand, and place in appropriate laboratory containers. Performance evaluation (PE) samples will be added to each sample delivery group at the laboratory.

11 REFERENCES

Anchor QEA (Anchor QEA, LLC) and ESI (Environmental Standards, Inc.), 2012. *Phase 2 Remedial Action Monitoring Quality Assurance Project Plan.* Hudson River PCBs Superfund Site. Prepared for General Electric Company, Albany, New York. May 2012.

Parsons, 2016. *Phase 2 Remedial Action Health and Safety Plan, Hudson River PCBs Superfund Site for 2016.* Prepared for General Electric Company, Albany, New York. February 2016.