LIST OF FIGURES

FIGURES

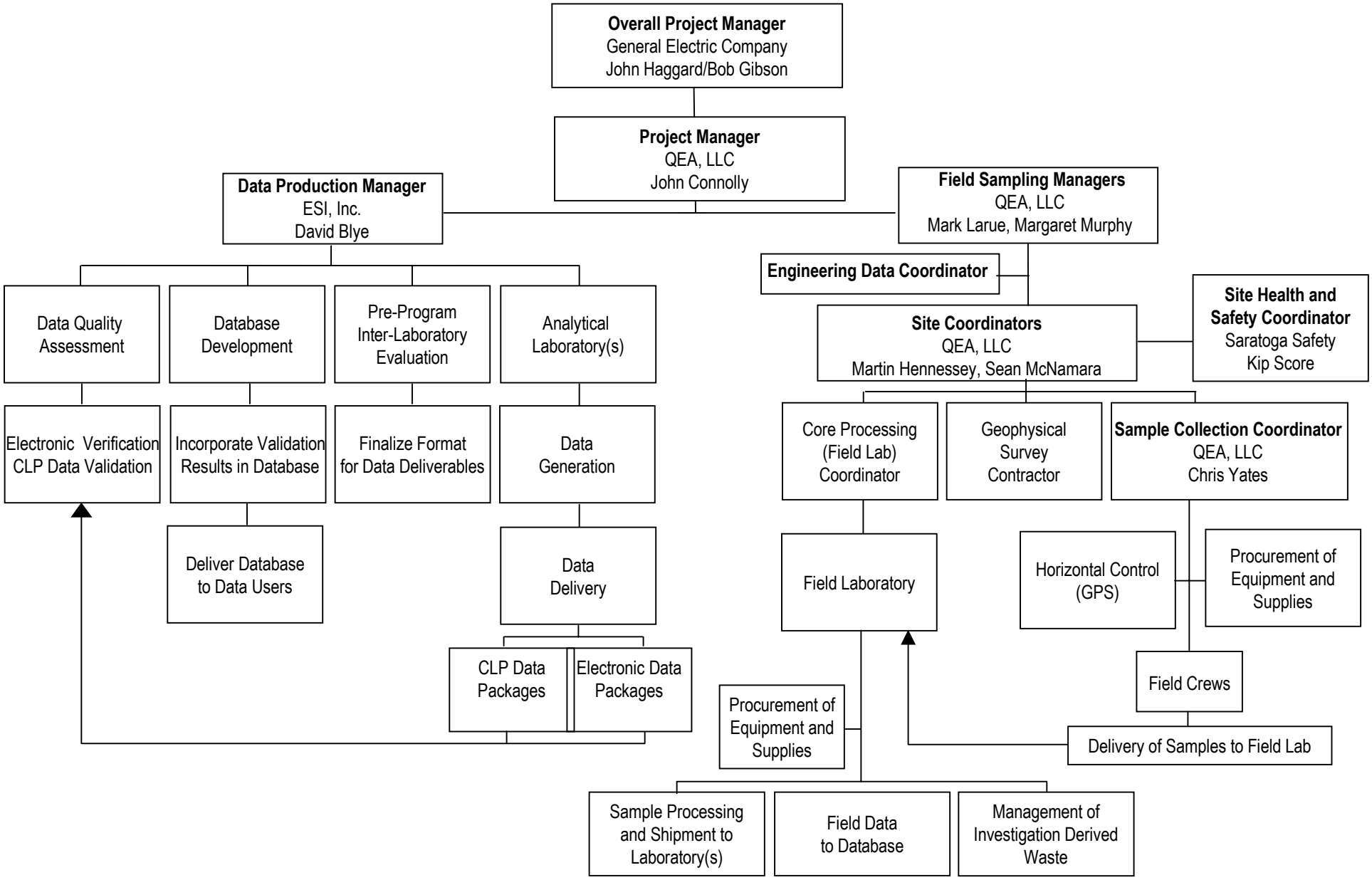

Figure A-1. Conceptual Organizational Chart

SCALE : NONE

GENrem 137

August 2002

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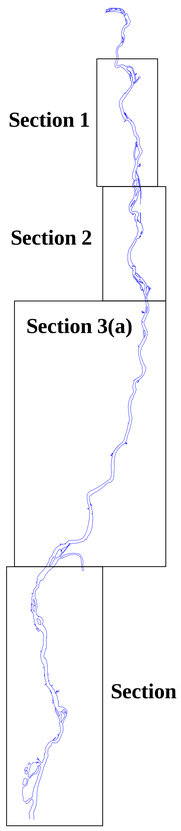

LEGEND

- Cities / Towns
- Dams / Locks

USEPA Dredge Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- 4 - 4.5
- 4.5 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- >8
- Shoreline

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Figure A-2.
Site Map.

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QEA
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GENrem 133 May 2002

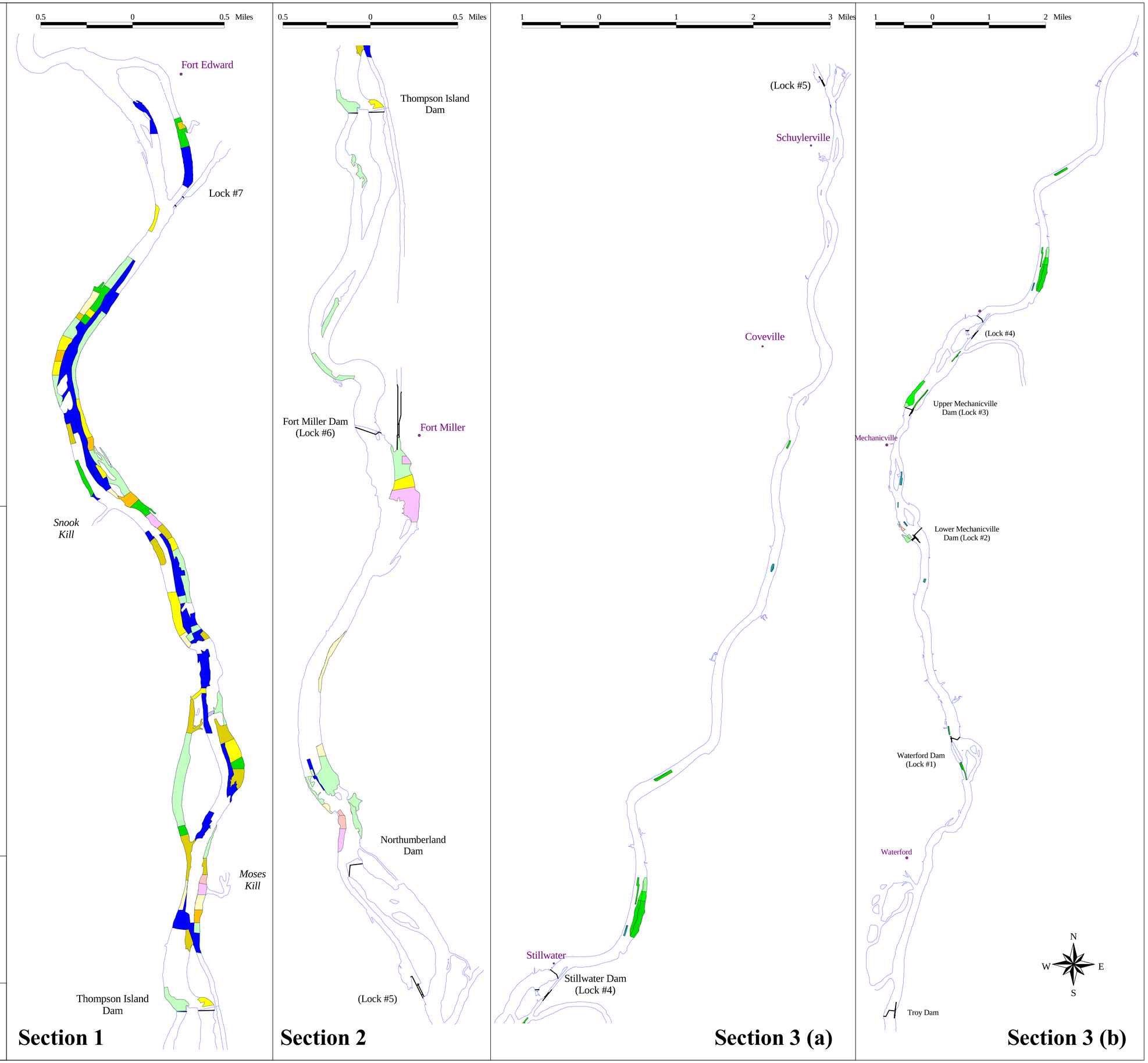

FIGURE A-3
SCHEDULE FOR SEDIMENT FIELD SAMPLING PLAN ACTIVITIES

Activity	Deadline (all days are calendar days)
1. Submission of draft HASP to EPA	Submitted
2. Submission of draft CHASP to EPA	Submitted
3. Submission of revised CHASP to EPA if necessary	14 days after effective date of Order or receipt of EPA comments on draft CHASP, whichever is later
4. Submission of draft QAPP to EPA	Submitted
5. Submission of revised QAPP to EPA if necessary	Consistent with Paragraph 35 of Order
6. Submission of Inter-lab Comparison Study (including evaluation of results)	35 days after effective date of Order
7. Commencement of Year 1 field activities – core sample collection and side-scan sonar survey	Either: (a) 21 days from latest of: EPA approval of QAPP, EPA approval of CHASP, submission of Interlab Comparison Study, or obtaining of access agreement for use of docking area in TIP; or (b) upon obtaining Canal Corp. approval (e.g. Canal Work Permit) – whichever is later
8. Submission of Sub-bottom Profiling Test Work Plan and associated QAPP to EPA	60 days from effective date of Order
9. Implementation and completion of sub-bottom profiling test	In accordance with schedule in Sub-bottom Profiling Test Work Plan as approved or modified by EPA
10. Completion of other Year 1 field activities, including core sample collection and side-scan sonar survey (but excluding investigation of land cut)	November 1, 2002, or such later date as is agreed to by EPA and GE
11. Completion of investigation of land cut following draining of canal	December 31, 2002, subject to acceptable weather conditions, or such later date as is agreed to by EPA and GE
12. Submission of Data Summary Report for Year 1 to EPA	The later of: (a) 90 days after completion of all Year 1 field activities (excluding investigation of land cut); or (b) 30 days after completion of all required data validation (if any) of Year 1 sample analytical results
13. Submission of revised Data Summary Report for Year 1, if necessary	Consistent with Paragraph 35 of Order
14. Submission of Supplemental Field Sampling Plan (FSP) and associated updates to QAPP	30 days after EPA approval of Data Summary Report for Year 1
15. Commencement of Year 2 field activities – core sample collection, bathymetric survey, and supplemental sub-bottom profiling work (if necessary)	The later of: (a) 30 days after EPA approval of Supplemental FSP and associated updates to QAPP; or (b) the opening of the lock system

FIGURE A-3
SCHEDULE FOR SEDIMENT FIELD SAMPLING PLAN ACTIVITIES

Activity	Deadline (all days are calendar days)
16. Completion of Year 2 field activities, including core sample collection, bathymetric survey, and supplemental sub-bottom profiling work (if conducted)	October 31, 2003, or such later date as is agreed to by EPA and GE
17. Submission of Data Summary Report for Year 2 to EPA	The later of: (a) 90 days after completion of all Year 2 field activities; or (b) 30 days after completion of all required data validation (if any) of Year 2 sample analytical results
18. Submission of revised Data Summary Report for Year 2, if necessary	Consistent with Paragraph 35 of Order

Note: This schedule does not include the monthly progress reports required to be submitted during sediment field sampling activities under Paragraph 43 of Order.

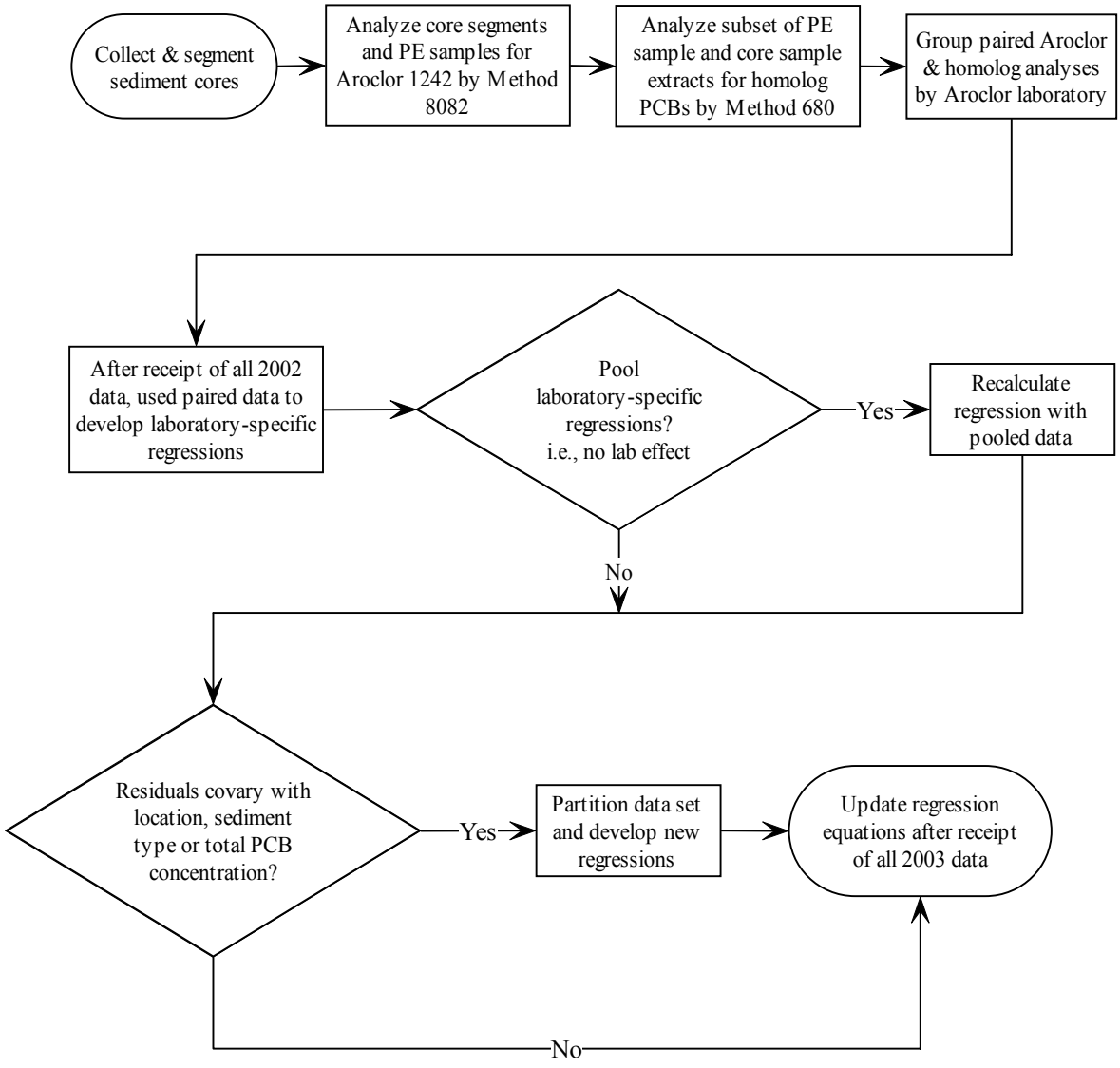

Figure A-4. Flow diagram for development of relationship between Aroclor PCB data and Tri+ PCBs. Note that data rejected by the verification/validation are excluded from the process.

FIGURE A-5 DELETED FOR REVISION 4

HUDSON RIVER SEDIMENT SAMPLING AND ANALYSIS PROGRAM

Coring Field Log

Relinquished by:_____ Date: _____ Time: _____ Sampler:_____

Received by:_____ Date: _____ Time: _____ Weather:_____

Core ID	Date	Time	Northing	Easting	Water Depth (ft)	Probing Depth (in)	Sediment Type	Sediment Description	Sample Type **	Core Recovered	Tube Material *	Penetration (in)	Recovery (in)
										☐			
										☐			
										☐			
										☐			
										☐			
										☐			
										☐			
										☐			
										☐			
										☐			
										☐			

* Tube Material: A = Aluminum, L = Lexan ** Sediment Type: C = Core, G = Grab

Date Printed: 7/17/02

Page 1 of 1

Figure A-6
EXAMPLE FIELD LOG FORM

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SCALE : NONE

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GENrem 137

August 2002

ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:
Sample Custodian: LML
Lab:

Client: General Electric Company

Project: Hudson River Design Support Sediment Sampling Program

COC Sample Number	Field Sample ID	QA/QC	MS / LD	Date Processed	Time Processed	Media*	# Containers	Aroclor PCB (GEH-R0062)	137Cs (gamma spectroscopy)	Moisture Content (ASTM D2216-98)	Bulk Density (USACE EM-1110-2-1906)	Total Organic Carbon (Lloyd Kahn)	Geotechnical Parameters Grain Size (ASTM D422) Atterberg Limits (ASTM D4318-00) Specific Gravity (ASTM D854-00) USCS Classification (ASTM D2487)	Disposal Parameters TCLP Metals (6010B/7470A-TCLP) TCLP Volatiles (8260B-TCLP) TCLP Semivolatiles (8270C-TCLP) TCLP Pesticides (8081A-TCLP) TCLP Herbicides (8151A-TCLP) Ignitability (SW-846 Chapter 7)	Dioxins/Furans (EPA 1613)	Homolog PCB (GEH-R0080)	Total RCRA Metals (6010B/7471A-RCRA)
001			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
002			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
003			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
004			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
005			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
006			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
007			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
008			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
009			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
010			☐			S	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments:

Relinquished by:	Received by:	Relinquished by:	Received by:	Relinquished by:	Received by:
Signature	Signature	Signature	Signature	Signature	Signature
Print Name	Print Name	Print Name	Print Name	Print Name	Print Name
Company	Company	Company	Company	Company	Company
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

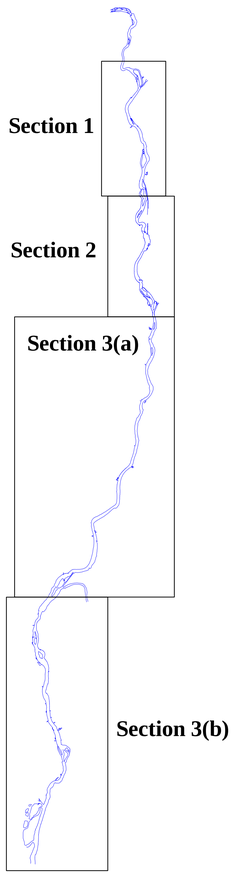
Date Printed: 9/27/2002 * S= SEDIMENT ***COC TYPE:*** *ARCHIVE* ***Page 1 of 2***

Figure A-7. Environmental Sample Chain of Custody

SCALE : NONE

Quantitative Environmental Analysis, LLC

GENrem 137 Sept. 2002



LEGEND

- 2001 GE Bathymetry Survey
- Dams / Locks
- Shoreline
- Proposed Bathymetry Transects

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Figure B-1.
Bathymetric survey transects.

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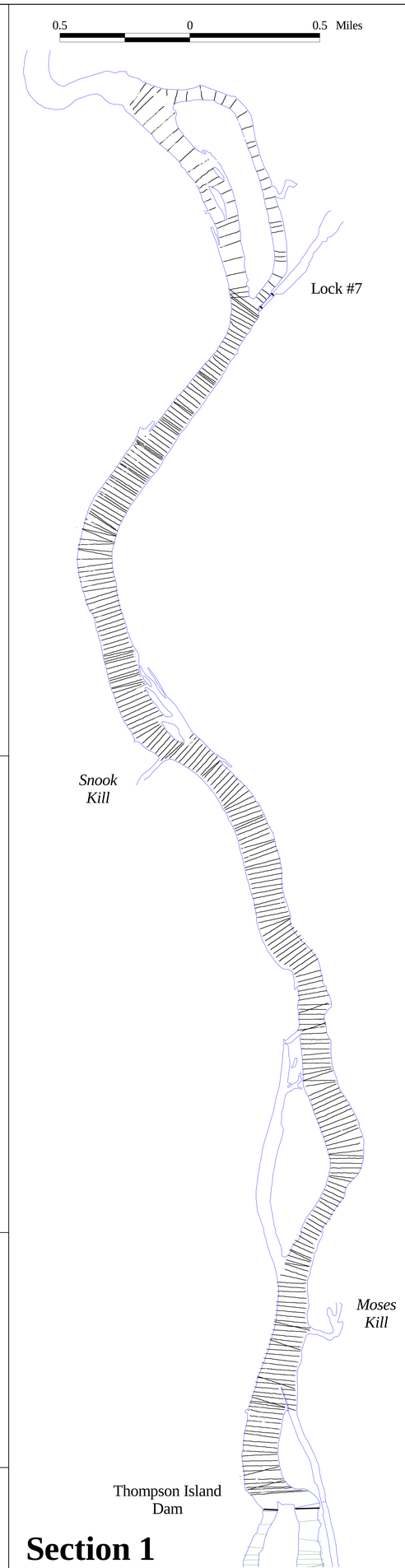
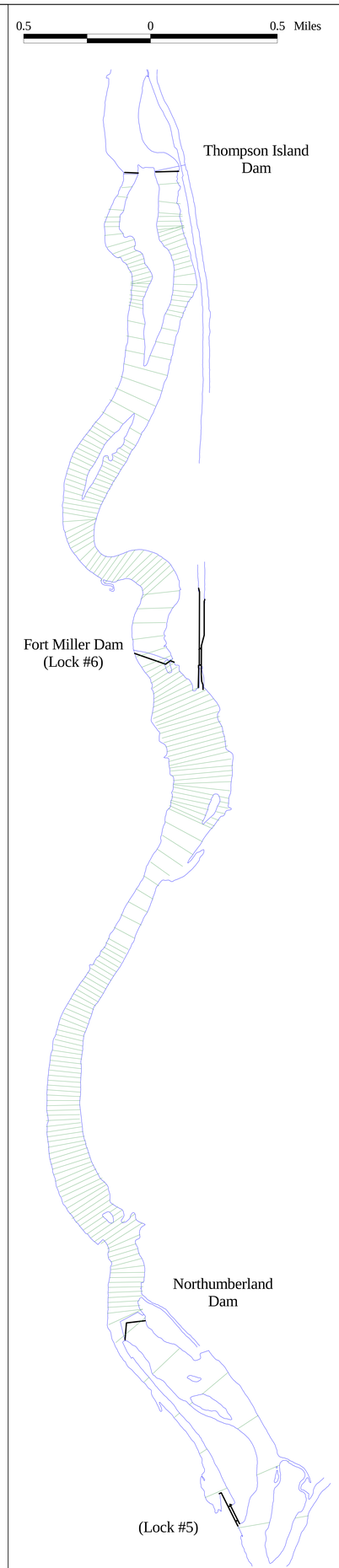
QEA
Quantitative Environmental Analysis, LLC

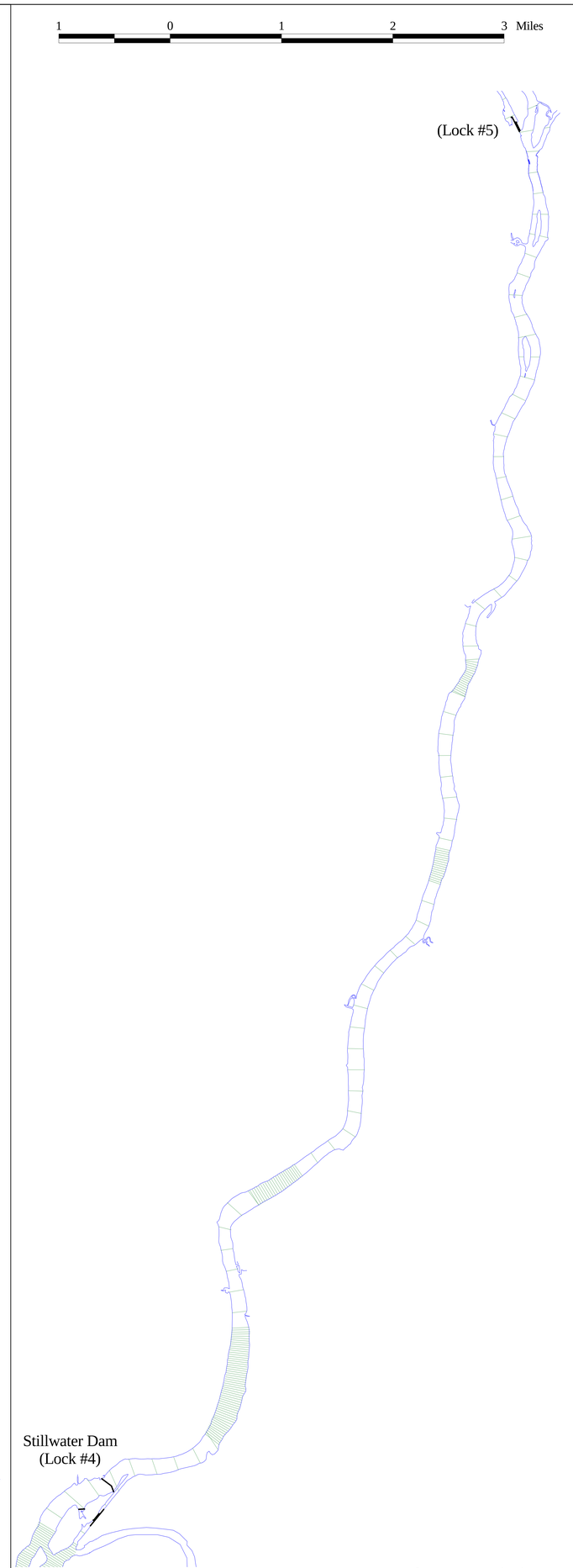
GENrem 133 May 2002



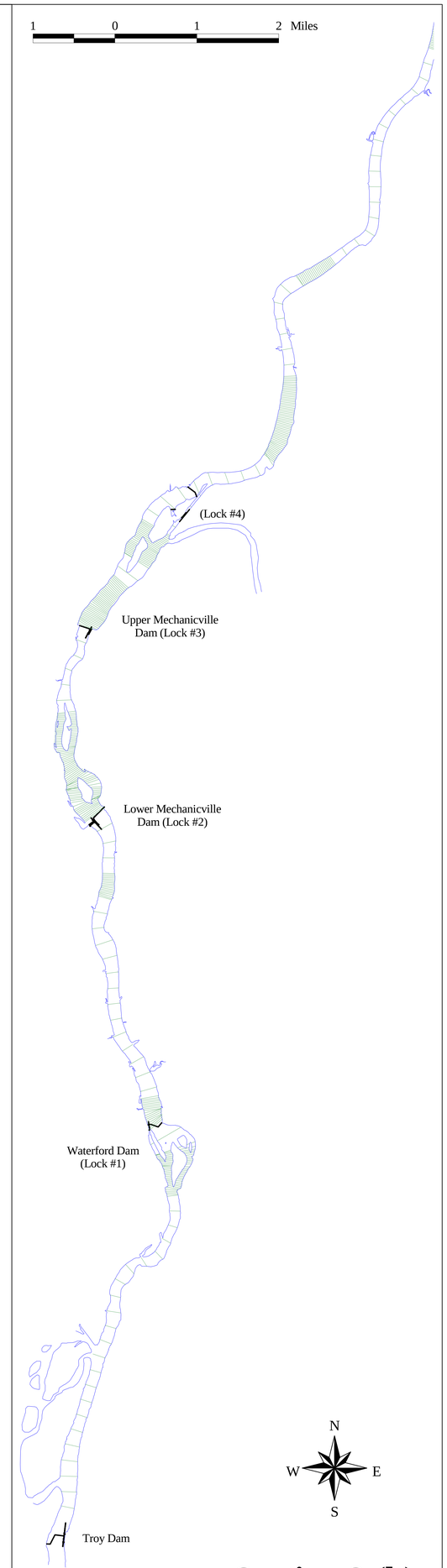
Section 1



Section 2



Section 3 (a)



Section 3 (b)

Figure B-1a Flow Diagram for GEHR680 Homolog PCBs Sample Analysis Selection

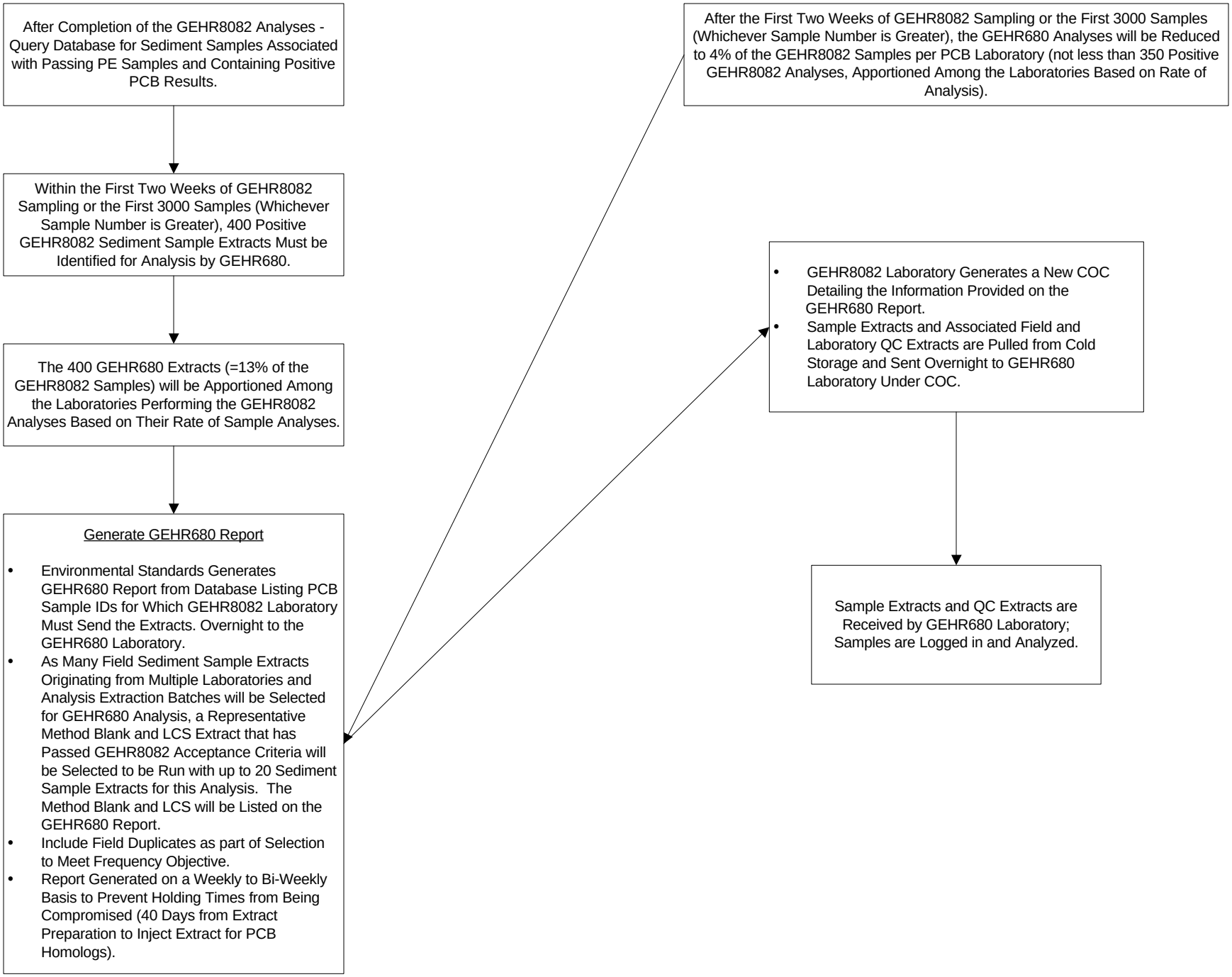
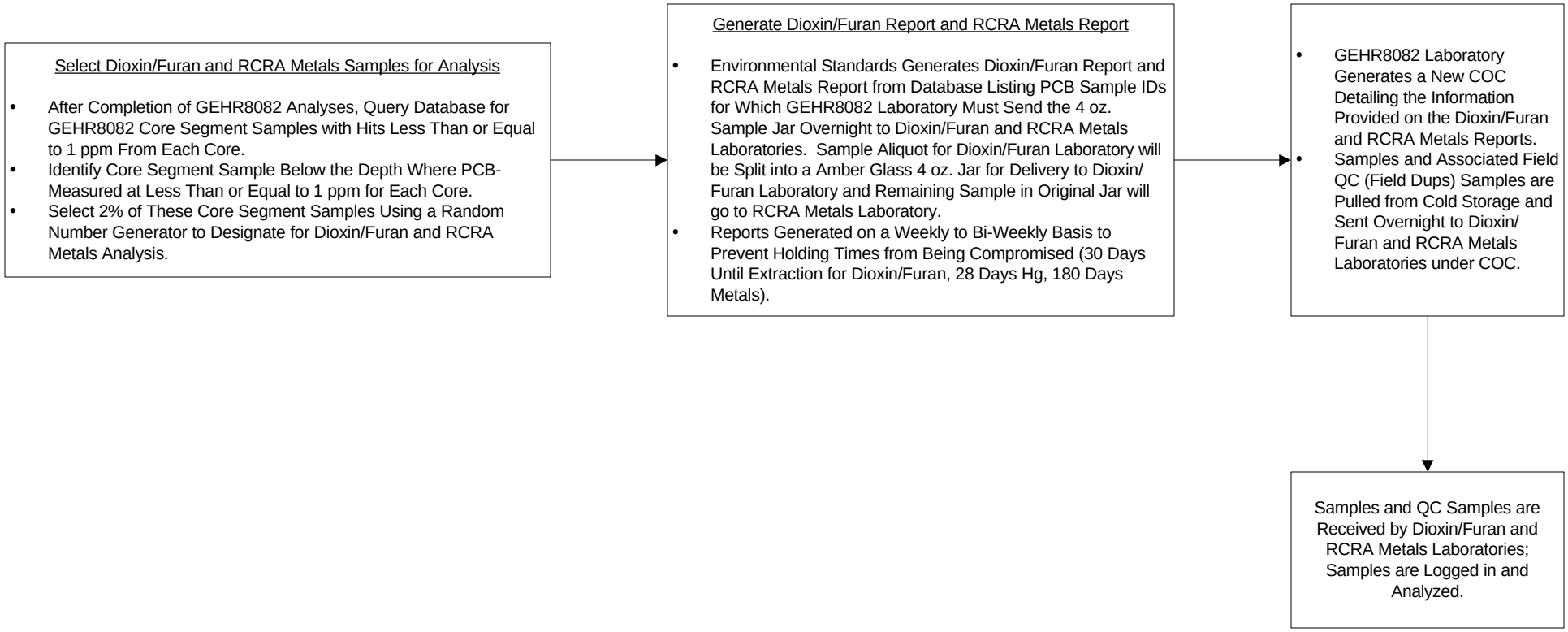
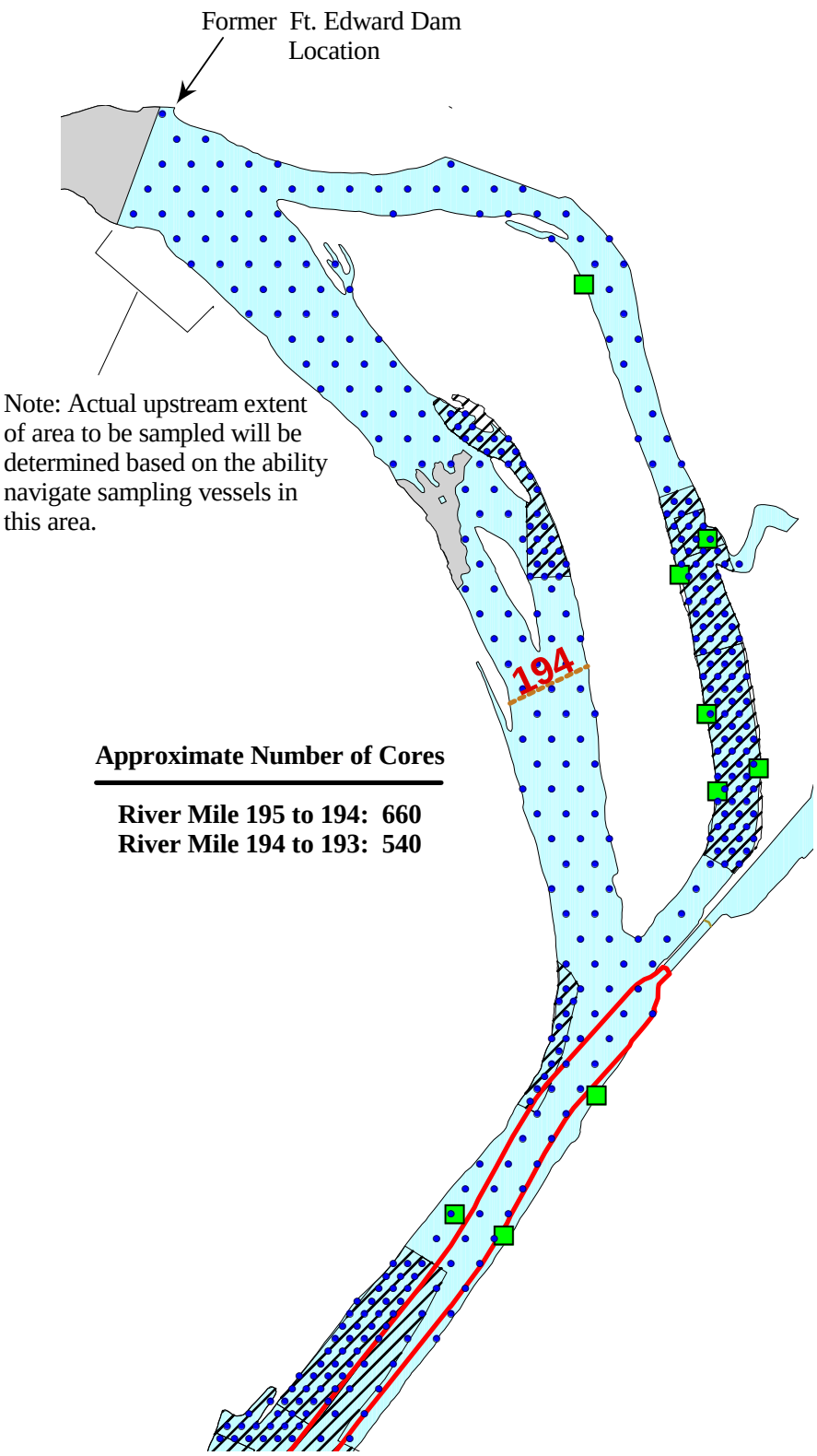


Figure B-1b Flow Diagram for Dioxin/Furan and RCRA Metals Sample Analysis Selection



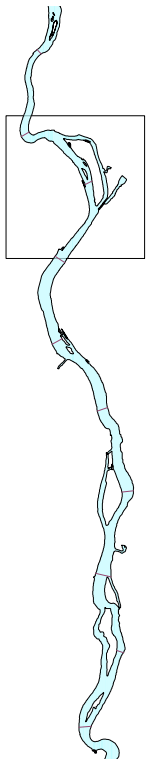
Dioxin-Furan and RCRA Metals.vsd



Approximate Number of Cores

River Mile 195 to 194: 660
River Mile 194 to 193: 540

Location Map



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Hudson River Project

Figure B-2a. River Miles 195-193, core sample locations in River Section 1

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GENrem:133 **May 2002**

Legend

- **Proposed Sediment Sample Locations**
- **NOAA Buoys**
- **Navigational Channel - Approximate Location**

REM-3/10/Select

- **Navigational Dredging**
- **Target Dredging**
- **Rocky Areas**
- **Hudson River**

N

1000 0 1000 Feet

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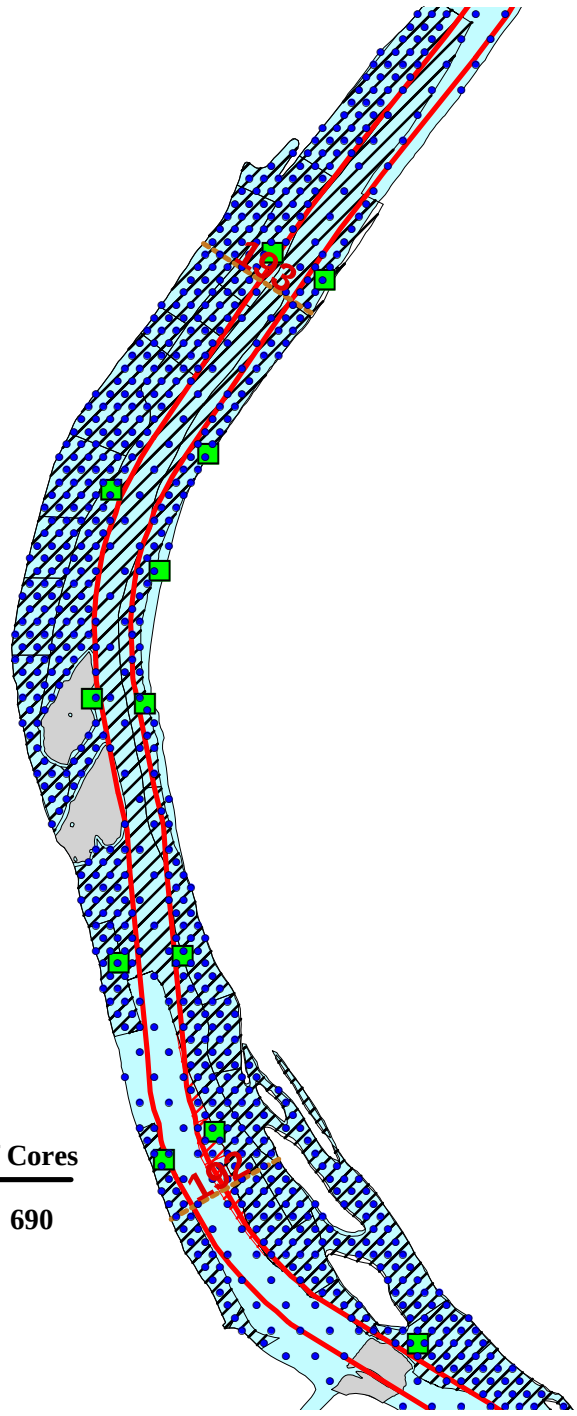
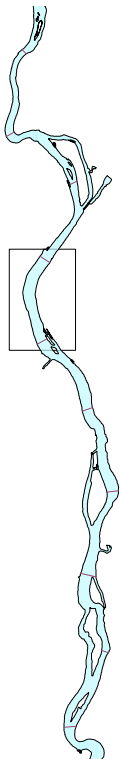


Approximate Number of Cores

River Mile 193 to 192: 690

Location Map



GENERAL ELECTRIC COMPANY
Hudson River Project

Figure B-2b. River Miles 193-192, core sample locations in River Section 1

Quantitative Environmental Analysis, LLC

GENrem:133 **May 2002**

Legend

- **Proposed Sediment Sample Locations**
- **NOAA Buoys**
- **Navigational Channel - Approximate Location**
- **REM-3/10/Select**
- **Navigational Dredging**
- **Target Dredging**
- **Rocky Areas**
- **Hudson River**

N

1000 0 1000 Feet

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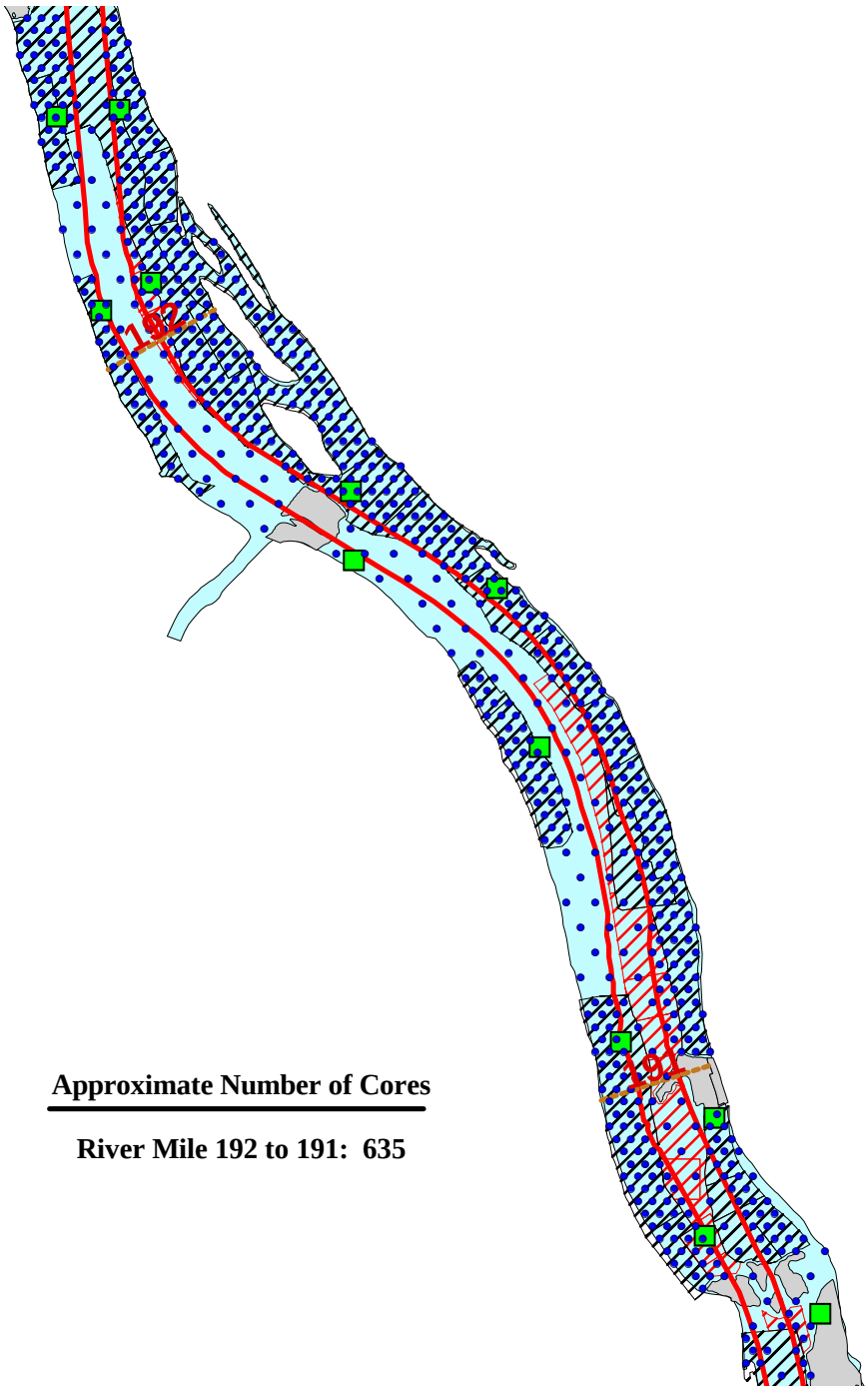
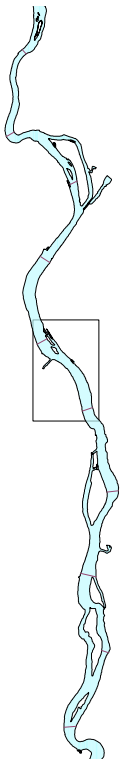


Approximate Number of Cores

River Mile 192 to 191: 635

Location Map



GENERAL ELECTRIC COMPANY
Hudson River Project

Figure B-2c. River Miles 192-191, core sample locations in River Section 1

QEA Quantitative Environmental Analysis, LLC

GENrem:133 **May 2002**

Legend

- **Proposed Sediment Sample Locations**
- **NOAA Buoys**
- **Navigational Channel - Approximate Location**

REM-3/10/Select

- **Navigational Dredging**
- **Target Dredging**
- **Rocky Areas**
- **Hudson River**

N

1000 0 1000 Feet

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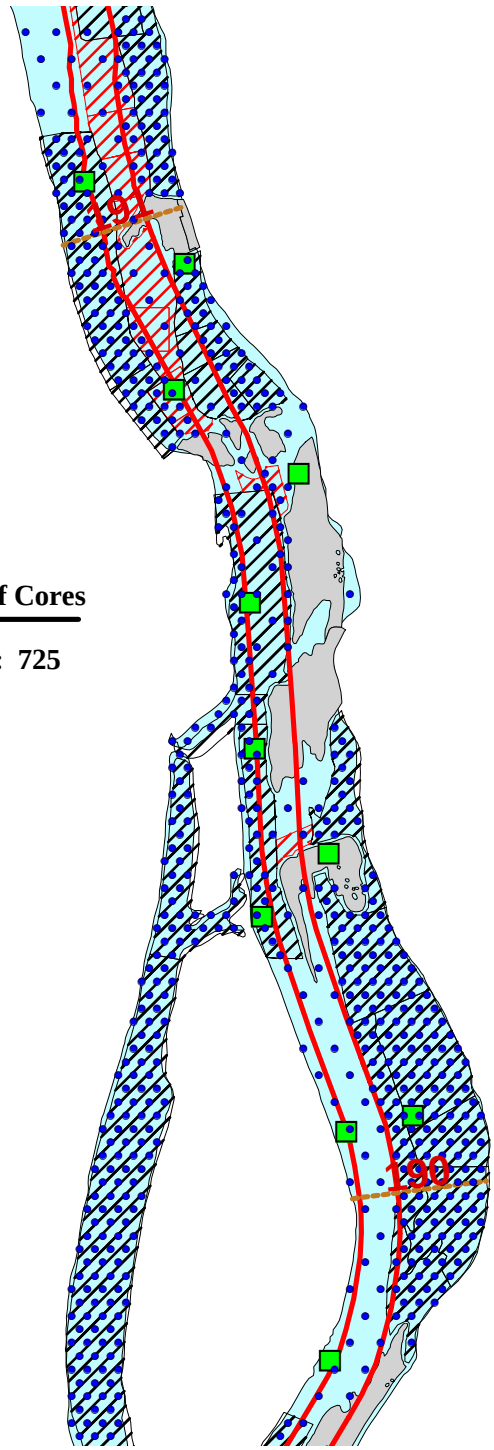
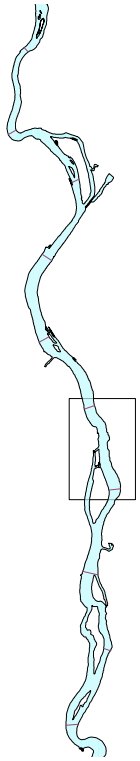


Approximate Number of Cores

River Mile 191 to 190: 725

Location Map



GENERAL ELECTRIC COMPANY
Hudson River Project

Figure B-2d. River Miles 191-190, core sample locations in River Section 1

GENrem:133 **May 2002**

Legend

- **Proposed Sediment Sample Locations**
- **NOAA Buoys**
- **Navigational Channel - Approximate Location**

REM-3/10/Select

- **Navigational Dredging**
- **Target Dredging**
- **Rocky Areas**
- **Hudson River**

N

1000 0 1000 Feet

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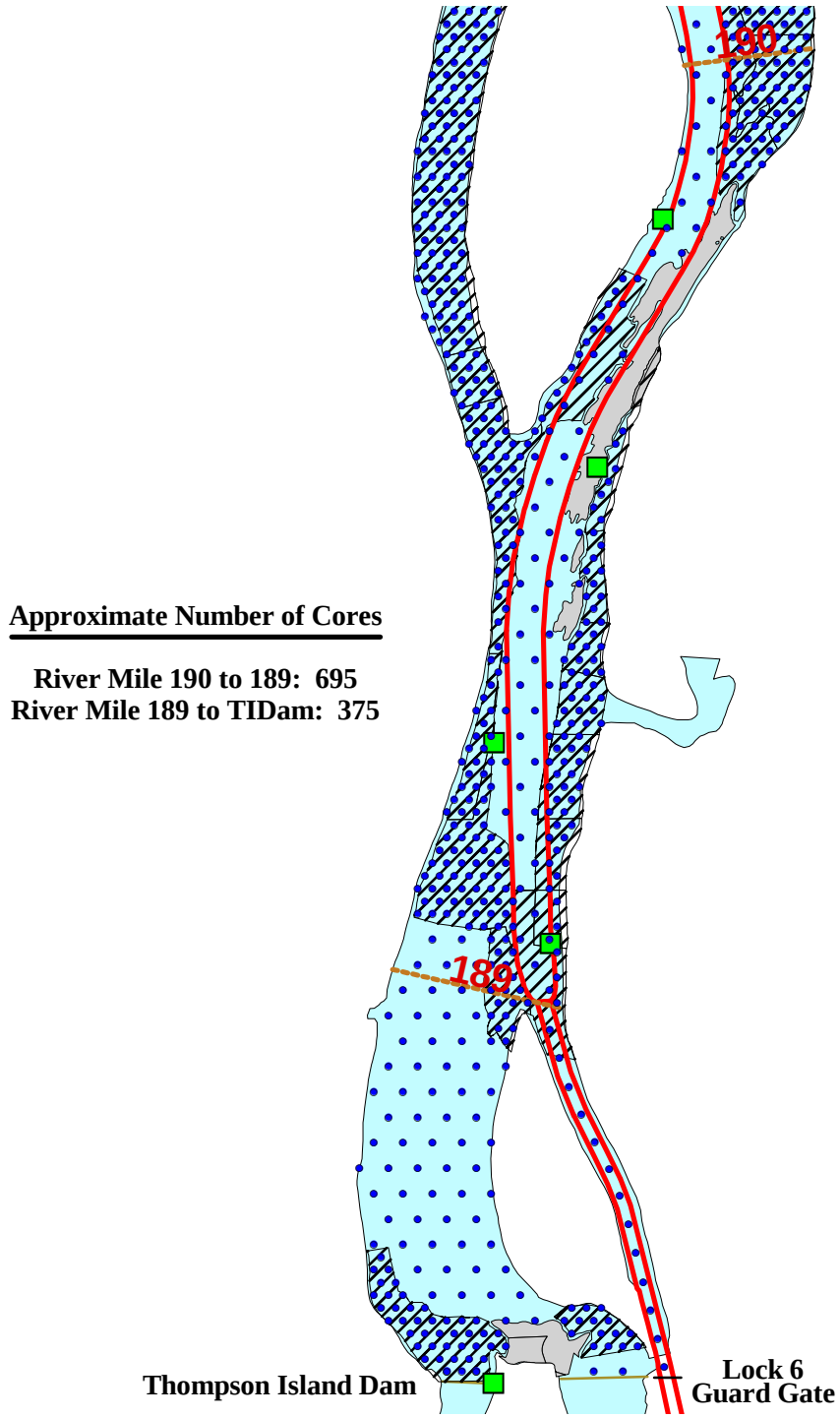
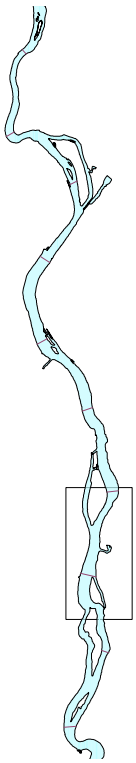


Approximate Number of Cores

River Mile 190 to 189: 695
River Mile 189 to TIDam: 375

Location Map



GENERAL ELECTRIC COMPANY
Hudson River Project

Figure B-2e. River Miles 190-TID, core sample locations in River Section 1

QEA Quantitative Environmental Analysis, LLC

GENrem:133 **May 2002**

Legend

- Proposed Sediment Sample Locations
- NOAA Buoys
- Navigational Channel - Approximate Location
- REM-3/10/Select
- Navigational Dredging
- Target Dredging
- Rocky Areas
- Hudson River

N

1000 0 1000 Feet

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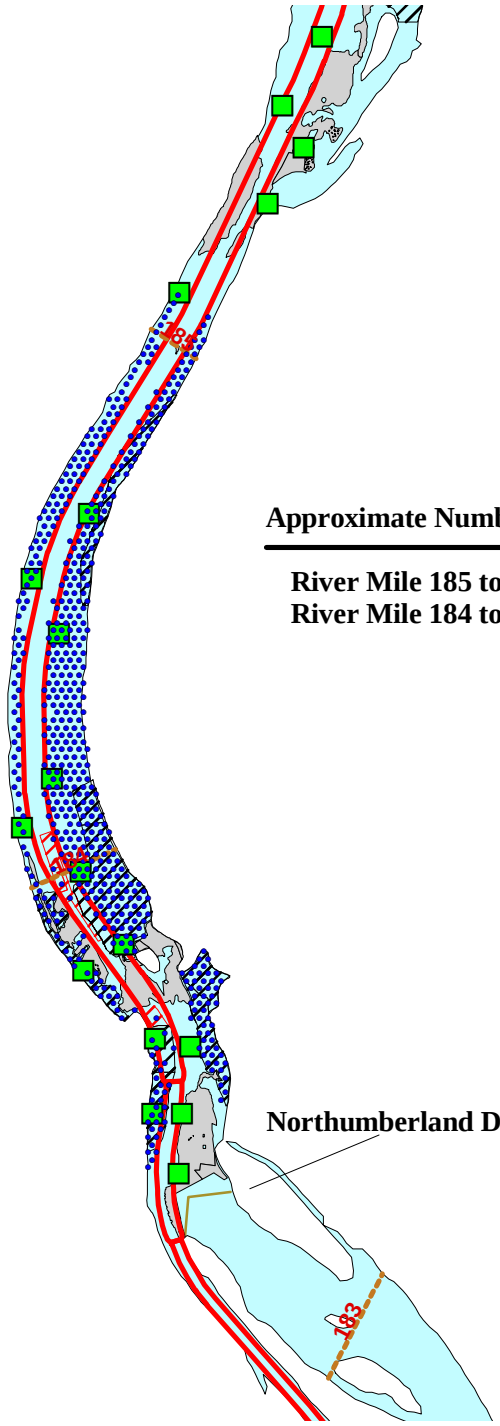
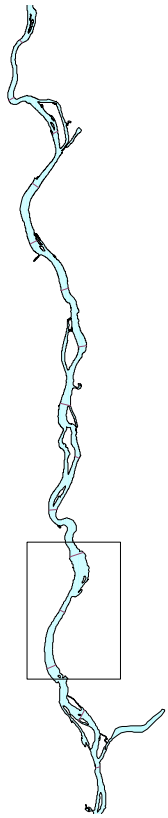


Approximate Number of Cores

River Mile 185 to 184: 389
River Mile 184 to 183: 194

Location Map



GENERAL ELECTRIC COMPANY
Hudson River Project

Figure B-2f. River Miles 185-183, core sample locations in River Section 2

GENrem:133 **August 2002**

Legend

- **Proposed Sediment Sample Locations**
- **NOAA Buoys**
- **Navigational Channel - Approximate Location**

REM-3/10/Select

- **Navigational Dredging**
- **Target Dredging**
- **Rocky Areas**
- **Hudson River**

N

2000 0 2000 Feet

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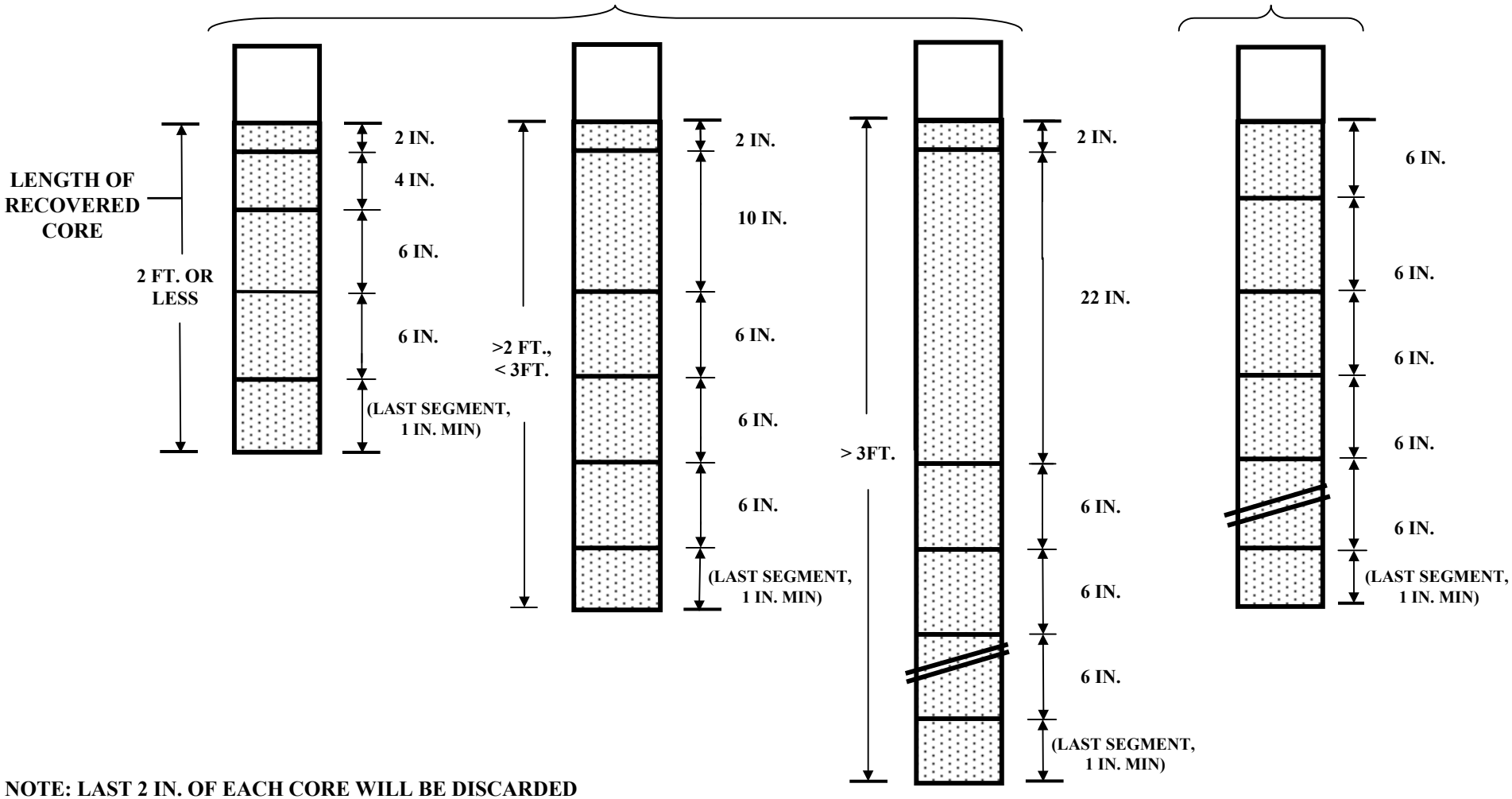


NOTE: LAST 2 IN. OF EACH CORE WILL BE DISCARDED

Figure B-3. Core Segmentation Approach.

SCALE : NONE

QEA Quantitative Environmental Analysis, LLC

GENrem 137 August 2002

IF: D:\GENrem\FSP\Core_segmentation2.ppt

Figure B-4. Example Sample Label

Hudson River Design Support Sediment Sampling Program

Field Sample ID:		RS1-9392-WT001-084090
Date Collected:	9/19/02	
Time Collected:	11:39	**AROCLOR**
Custodian Initials:	LML	

Figure B-5. Sediment Sample Collection and Processing Chart

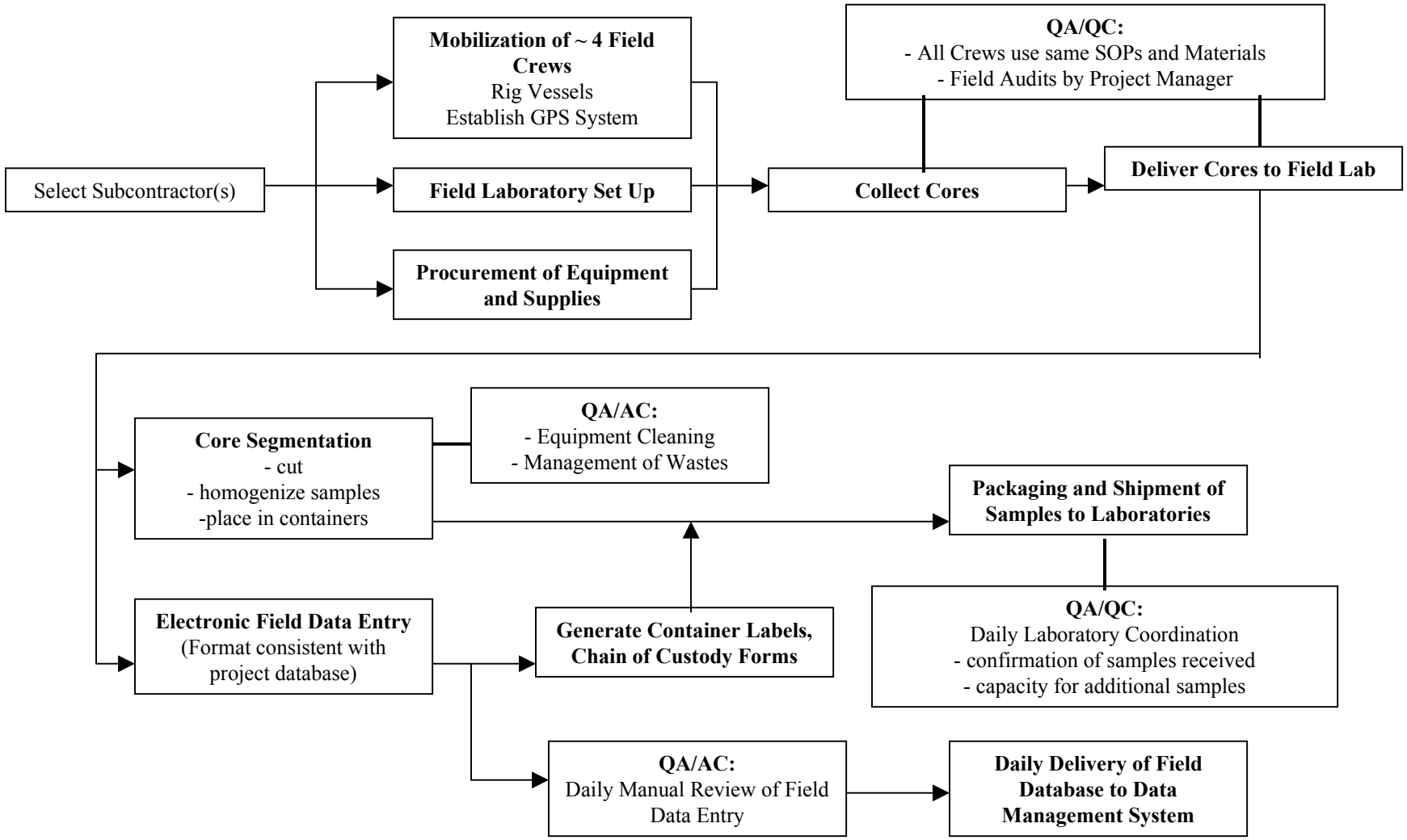
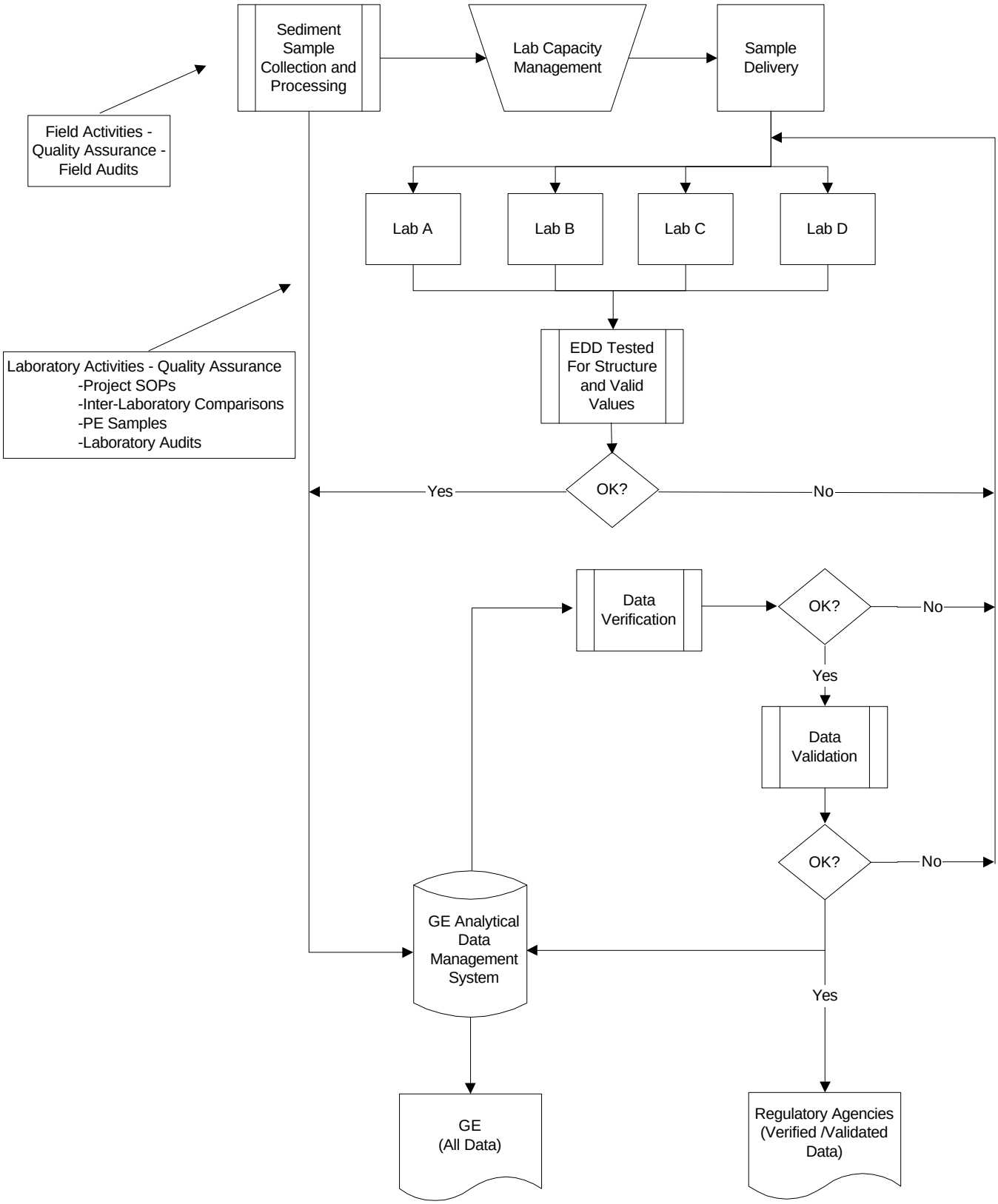


FIGURE B-6

Sediment Sample Collection Quality and Information Management Flow Chart



Quantitative Environmental Analysis, LLC
Sediment Core Field and Laboratory Data
Hudson River Design Support Sediment Sampling Program

Core-Specific Information

Core Location Information

Core ID:	RS1-9392-WT023
Date Collected:	07/31/2002
Time Collected:	10:52
Northing (ft)	696400.00
Easting (ft):	1184024.70
Water Depth (ft)	10.0

Unlock | Delete Core | Clear Form

Sampler Initials:	MJW
Contractor:	QEA,LLC

Sediment Probing

Probing Depth (in)	50
Probing Sediment Type:	FINE
Additional Probing Information:	

Core Recovery

(•) Core/Grab Was Recovere

Sample Type	CORE
Core Tube Material:	LEXAN
Core Penetration Depth (in):	50
Core Recovery Depth (in):	40
Lab Recovery (in):	
Core Weight (Kg):	

Figure B-7 Core Data Entry Form

SCALE : NONE

Field_data_figures.ppt

GENrem 137 August 2002

Quantitative Environmental Analysis, LLC
Sediment Core Field and Laboratory Data

Hudson River Design Support Sediment Sampling Program

Sample-Specific Information

Core Section Information

QA/QC: ENV

Parent Field Sample ID (DUP only):

Core ID: RS1-9392-WT023

Sample Type: CORE

Upper Depth (in): 0

Lower Depth (in): 2

Field Sample ID: RS1-9392-WT023-000002

Duplicates: No

Unlock | Delete Sample | Clear Form

Analytes

- [x] Aroclor PCBs
- [x] Moisture Content/Bulk Density
- [x] Total Organic Carbon
- [ ] Split
- [x] Archive
- [ ] Geotechnical Parameters
- [ ] Disposal Parameters
- [x] Radionuclides

Container: 2

Core Section Description

Texture Description

Primary	Some	Little	Trace	
CS	--	--	OR	CS/--/--/OR

General Description:

Cultural Observations:

Date Processed: 07/31/2002

Time Processed: 11:07

Sample Custodian Initials: MJW

Figure B-8 Core Processing Data Entry Form

SCALE : NONE

Field_data_figures.ppt

GENrem 137

August 2002

Figure C-1 Flow Diagram of Initial PCB PE Acceptance Limit Generation

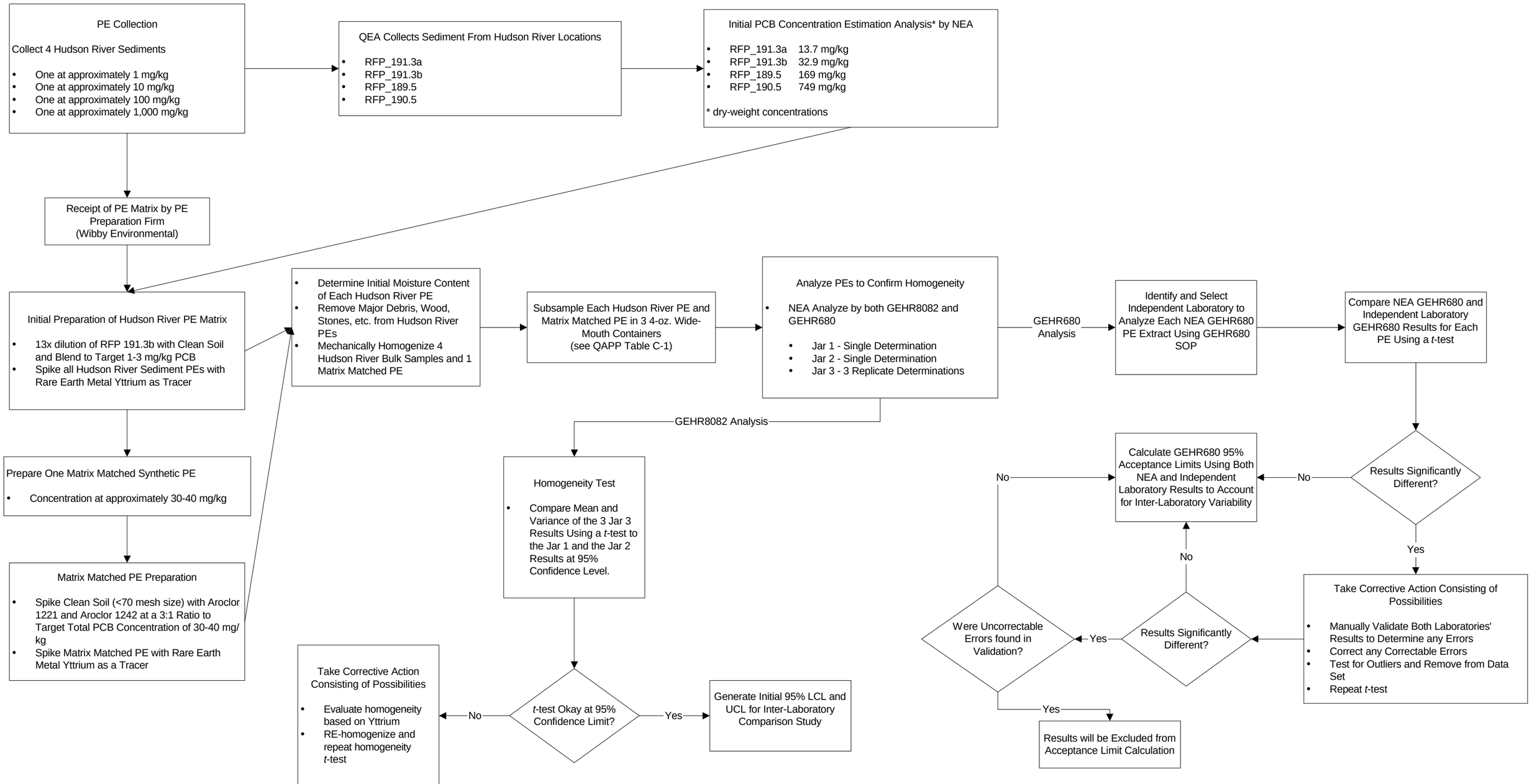


Figure Initial PE Limits.vsd

Figure C-2 Flow Diagram of Inter-Laboratory Comparison Study PE Analysis

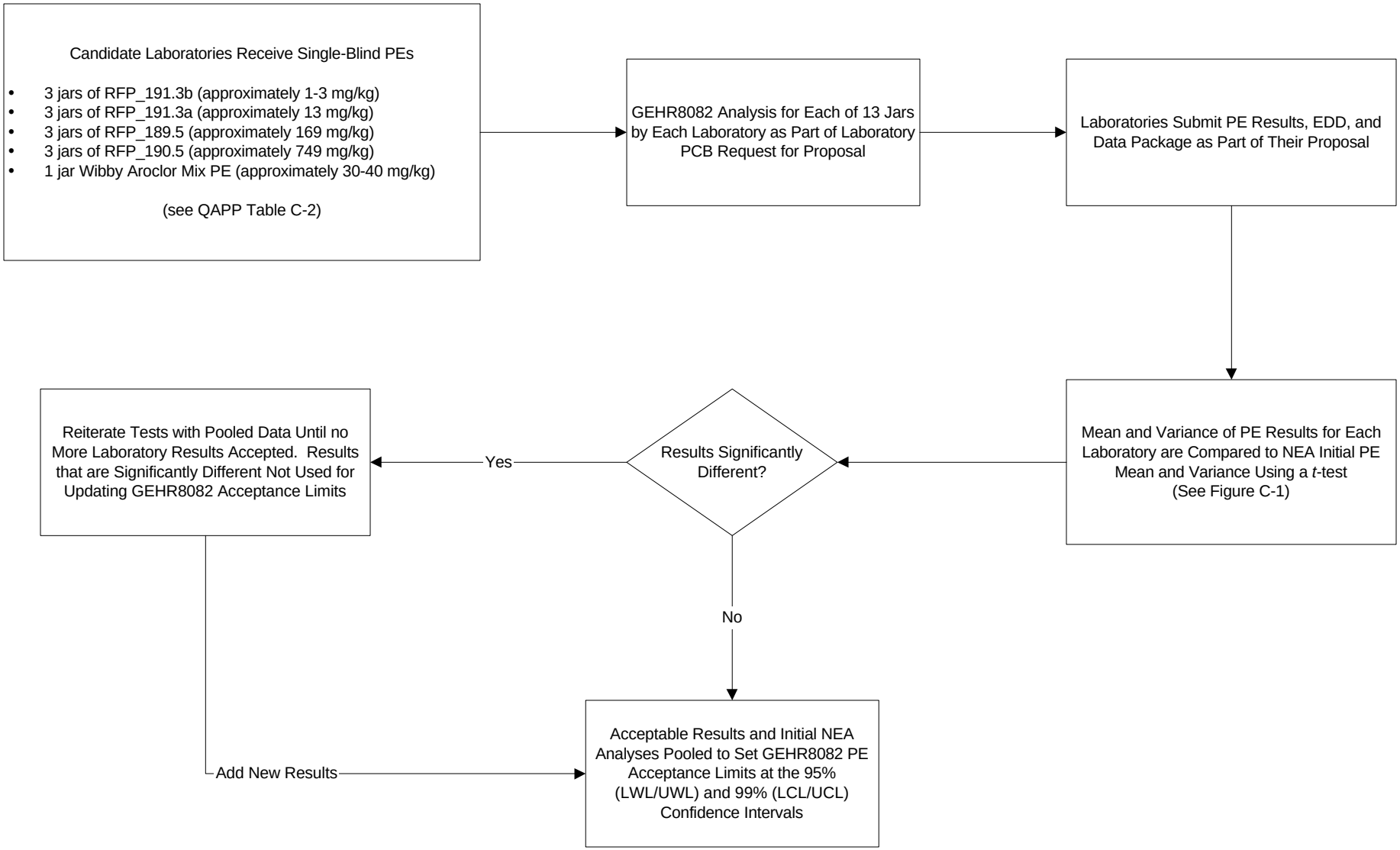


Figure C-3 Flow Diagram for GEHR8082 and GEHR680 PE Sample Analysis

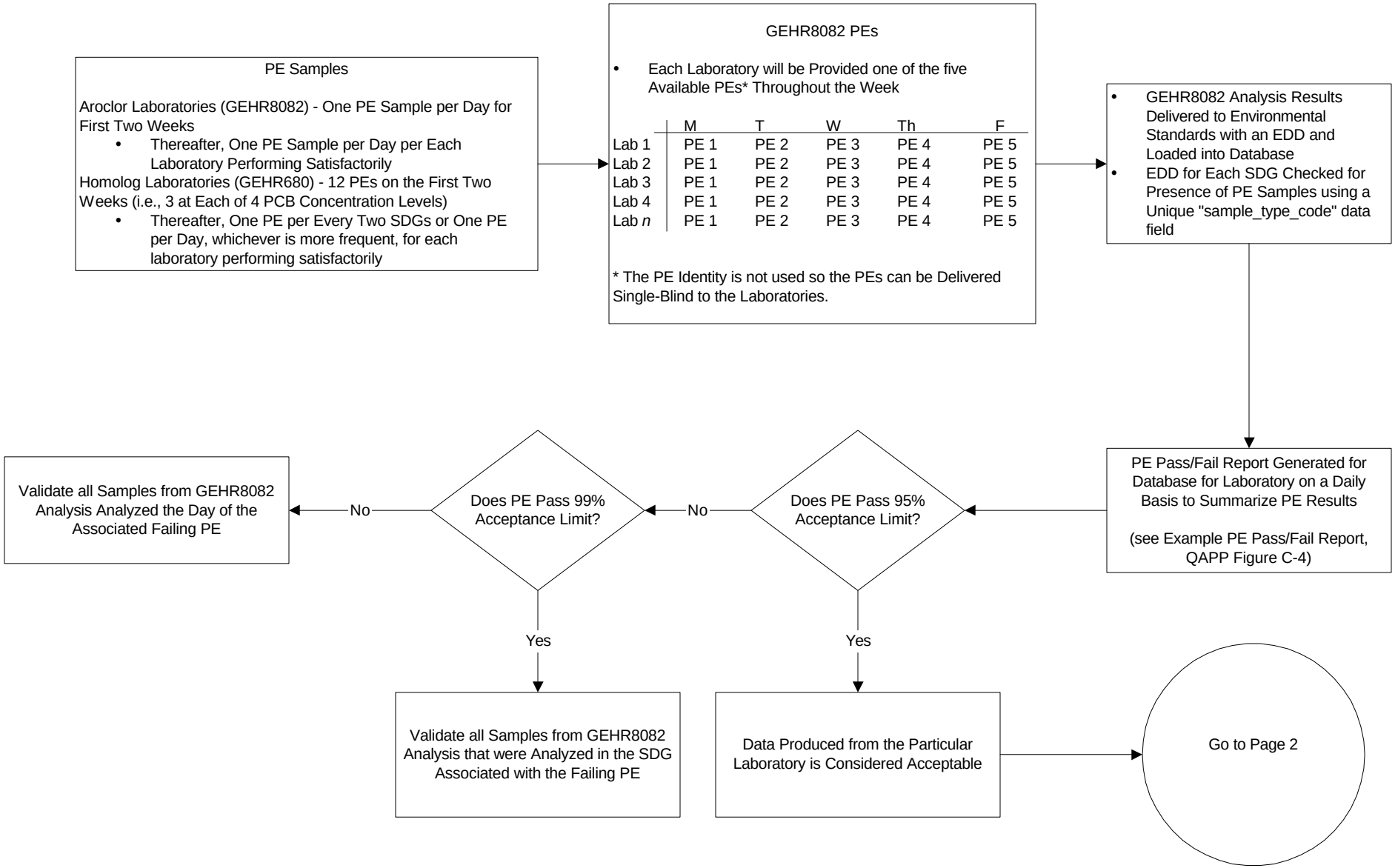


Figure C-3 Flow Diagram for GEHR8082 and GEHR680 PE Sample Analysis

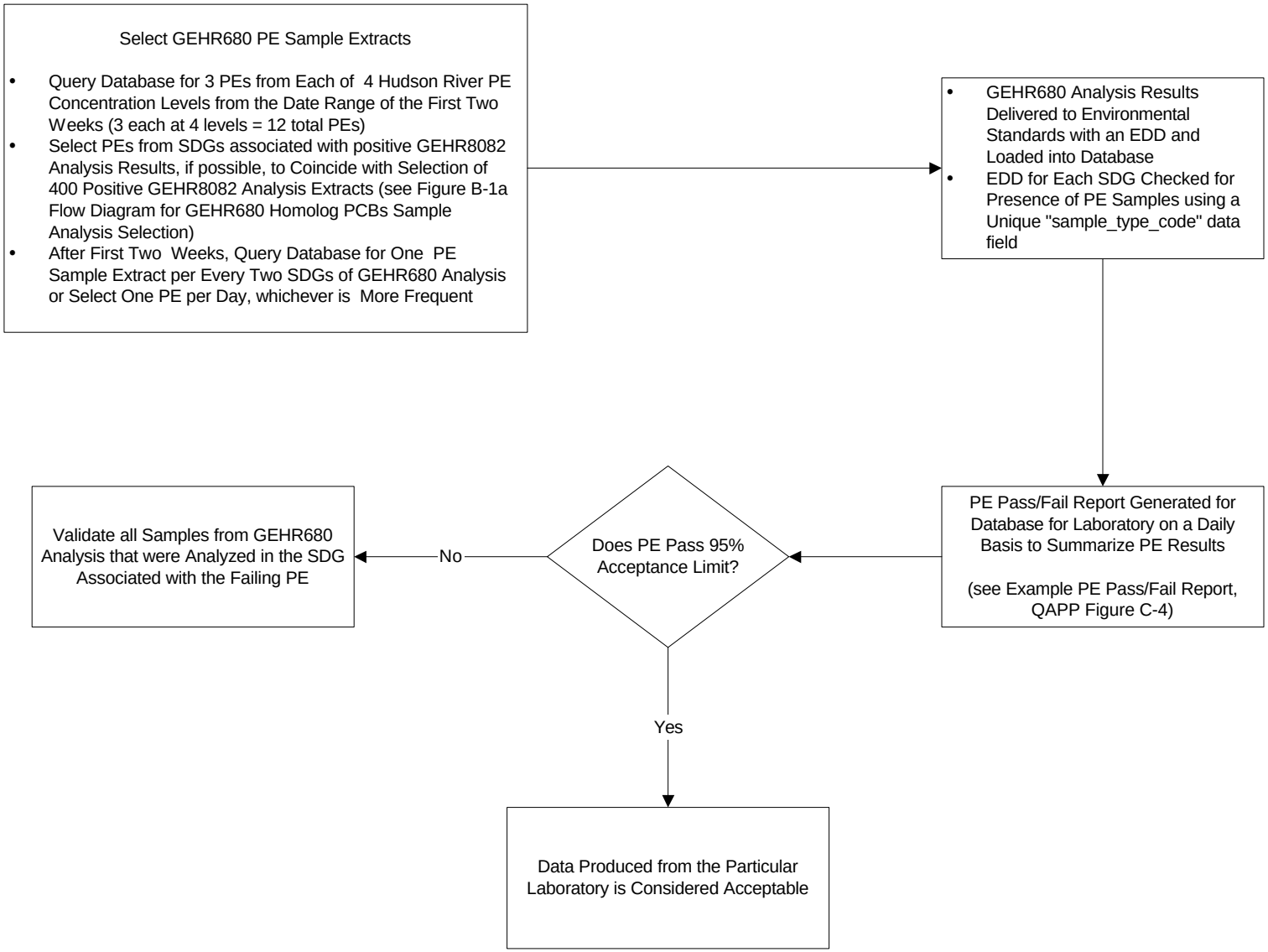


Figure 8082_680

Figure C-4
Example PE Sample Result Pass/Fail Summary Report
GE Hudson River Design Support Sediment Sampling and Analysis Program

LABORATORY: _____
PE ID: _____
COC: _____
SDG: _____
DATE COLLECTED: _____
METHOD: _____

	Result		95%		WL Qualifer	99%		CL Qualifer
	mg/Kg	MDL	LWL	UWL	P or F	LCL	UCL	P or F
Aroclor-1016								
Aroclor-1221								
Aroclor-1232								
Aroclor-1242								
Aroclor-1248								
Aroclor-1254								
Aroclor-1260								
Total PCBs								

Notes:
MDL= Method Detection Limit
LWL/UWL= Lower Warning Limit/Upper Warning Limit
LCL/UCL= Lower Control Limit/Upper Control Limit
P/F= Pass/Fail
If WL Qualifer=F then the SDG containing the PE sample must be validated.
If CL Qualifer=F then all associated SDGs must be validated.

Associated SDGs and COCs	Validation ? (Yes or No)
SDG 1/COC#	
Sample A	
Sample B	
Sample C	
SDG 2/COC##	
Sample D	
Sample E	
Sample F	
SDG 3/COC###	
Sample G	
Sample H	
Sample I	

FIGURE C-5: CORRECTIVE ACTION FORM

GENERAL ELECTRIC COMPANY
HUDSON RIVER DESIGN SUPPORT SEDIMENT SAMPLING AND ANALYSIS PROGRAM

Date: _____

Organization Name: _____

Initiator's Name and Title: _____

Problem Description: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Reported To: _____

Corrective Action: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Approved by (USEPA RPM): _____Date: _____

Reviewed and Implemented By: _____

cc: GE Program Manager - _____

QA Program Manager - _____

Other Distribution: _____