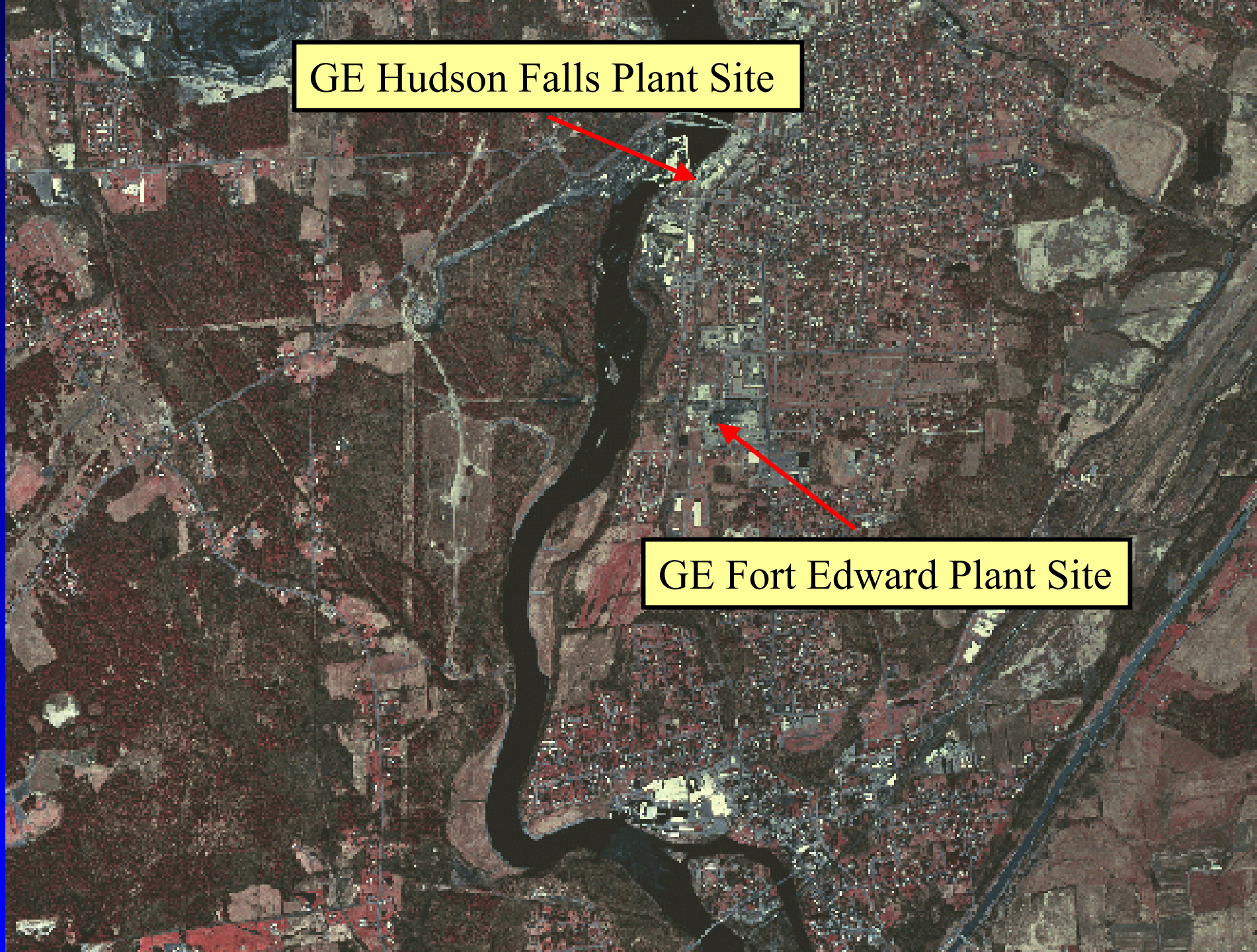
Remedial Programs at the GE Hudson Falls and GE Fort Edward Plant Sites

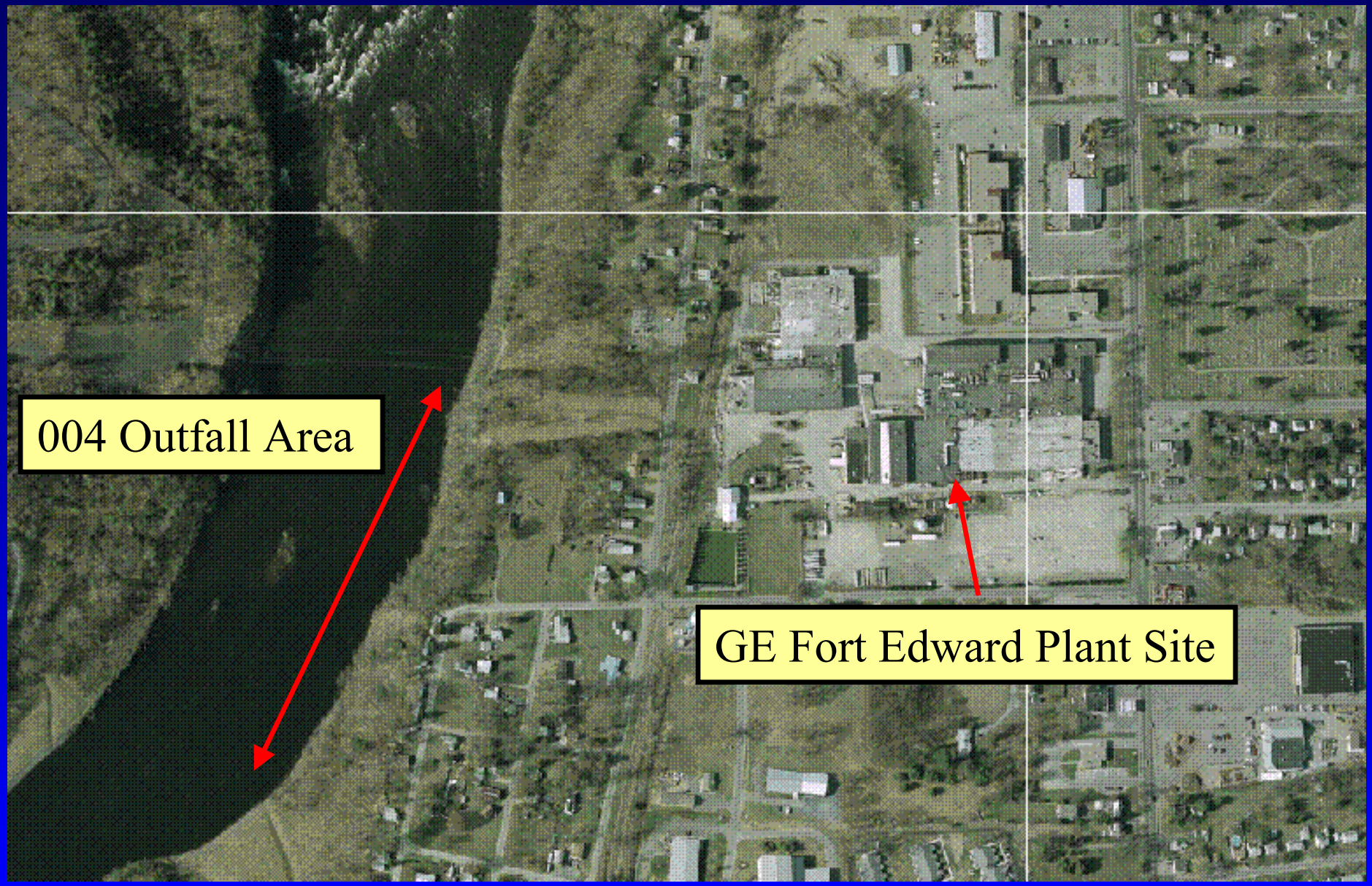
Presented to USEPA Community Advisory Group
March 25, 2004

Division of Environmental Remediation
New York State
Department of Environmental Conservation


GE Hudson Falls Plant Site
GE Fort Edward Plant Site

Site Location – GE Fort Edward

- Town of Fort Edward, Washington County
- Located along Park Avenue, between Broadway and Lower Allen Street
- County office complex to the north
- Rail line adjacent to the site to the west
- Hudson River approximately 800 feet west of the main manufacturing area


004 Outfall Area
GE Fort Edward Plant Site

Site Background

- Prior to 1947: Site used by GE for production of electric motors
- 1947 – 1977: GE capacitor production using PCB as dielectric fluid
- 1977 to present: GE capacitor production using substitute dielectric fluids TCB, DEHP, PXE

Operable Units
GE Fort Edward Plant Site

- Operable Unit 1 – ongoing groundwater recovery and treatment program to mitigate overburden contaminant plume south of site
- Operable Unit 2 – ongoing groundwater recovery and treatment program on-site; soils removal and off-site disposal in 1990

Operable Units
GE Fort Edward Plant Site

- Operable Unit 3 – additional groundwater and PCB oil management in main manufacturing area
- Operable Unit 4 - area of contaminated soils and sediment adjacent to the former 004 outfall on the eastern shore of the Hudson River

Operable Units
GE Fort Edward Plant Site

- ROD issued in January 2000 for Operable Units 3 and 4
- GE elected to implement the Operable Unit 3 remedy, and to not implement the Operable Unit 4 remedy

Results of Remedial Investigations – OU 4

- Extent of PCB contamination defined in riverbank soils

Interim Remedial Measures

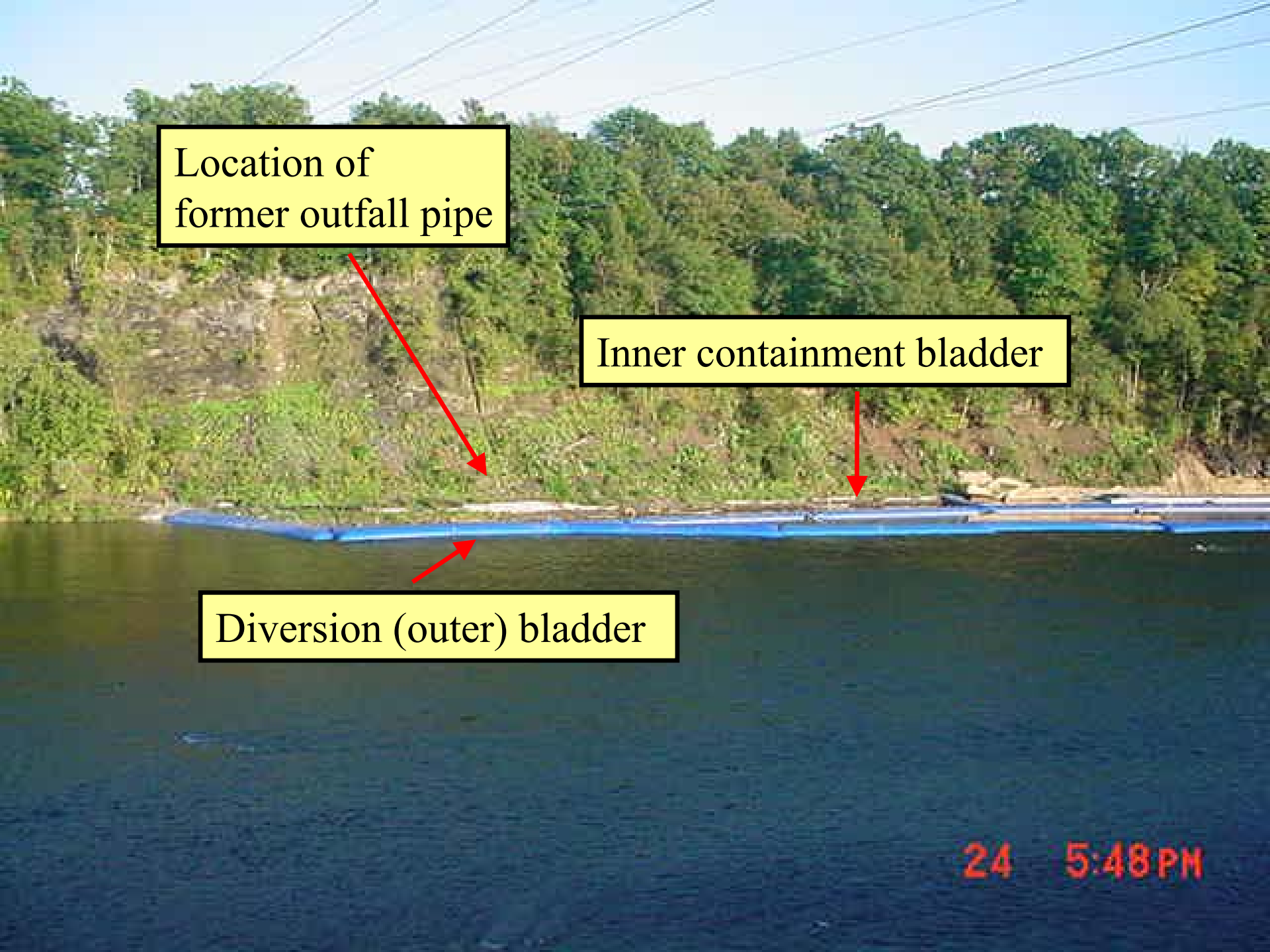
- Relocation of 004 outfall point to Hudson River
- Removal of former 004 outfall pipe and associated contaminated soils

Operable Unit 3 Remedy

- Building 40 (Foil Mill) groundwater and oil collection system
- Conversion of former sewer to groundwater collection system
- Installation and operation of additional “transition zone” recovery wells
- Installation and operation of horizontal well PCB oil collection system in south parking lot

Operable Unit 4 Remedy

- Removal and offsite disposal of PCB contaminated riverbank soils
- Estimated 16,000 tons of material to be removed


Location of former outfall pipe
Inner containment bladder
Diversion (outer) bladder
24 5:48PM


Debris pile location
24 5:48PM


Project logistics area
Remnant Site 3
Remnant Site 2
19 12:05PM


Diversion bladder installation
19 4:14PM


River stage during low flow
Oil sorbent boom
15 11:28AM


Outer diversion
Debris pile
Inner containment
25 8:03 AM


Access road
17 8:28AM

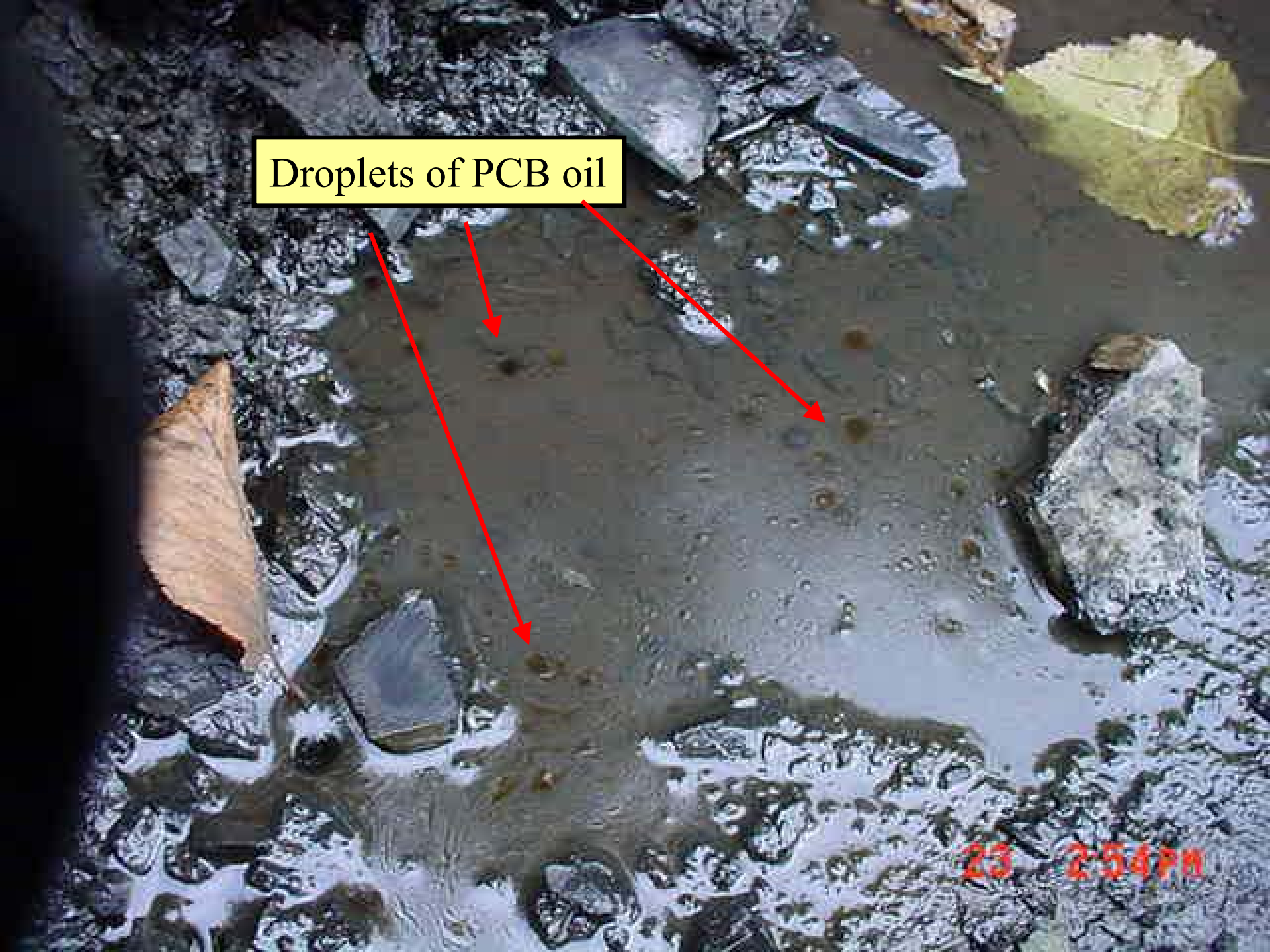

DEERE
TA25
1 1:09PM


DEERE
TA25
6 2:37 PM


Stockpile awaiting offloading
Decon pad
27 6:54PM


DEERE
18 8:34AM


DEERE
27 5:44PM

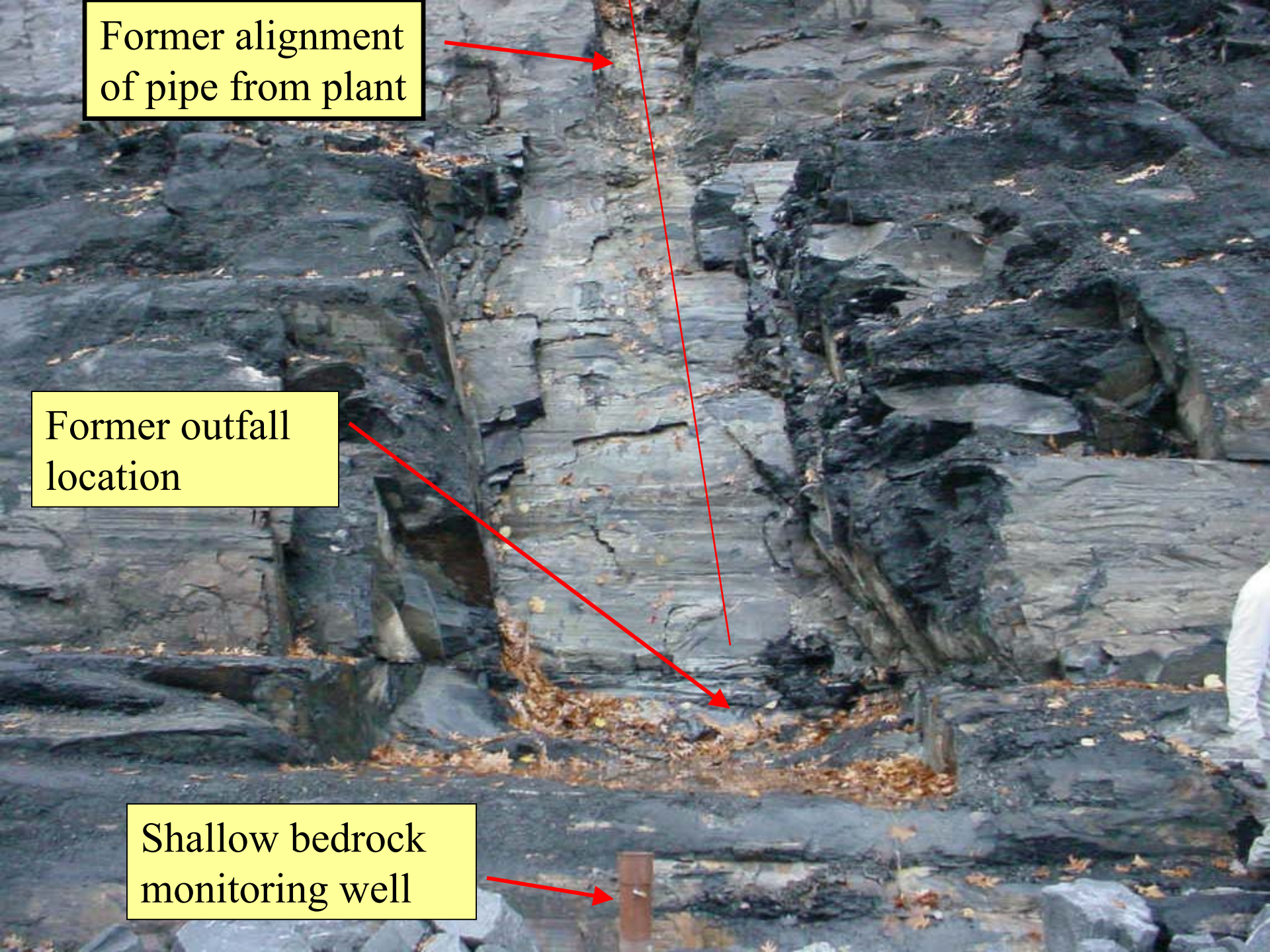

Droplets of PCB oil
23 2:54PM


18 8:43AM

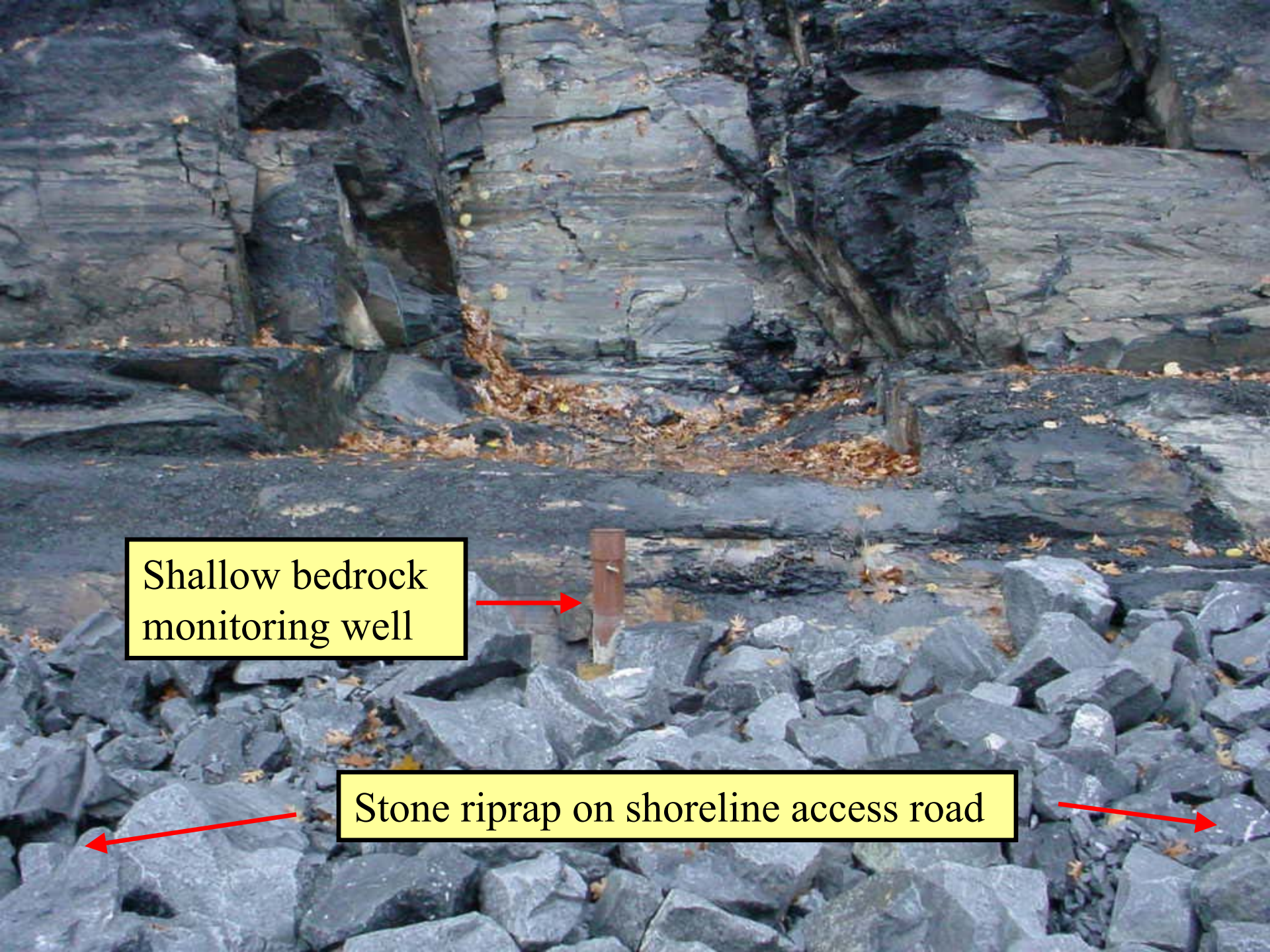

DEERE

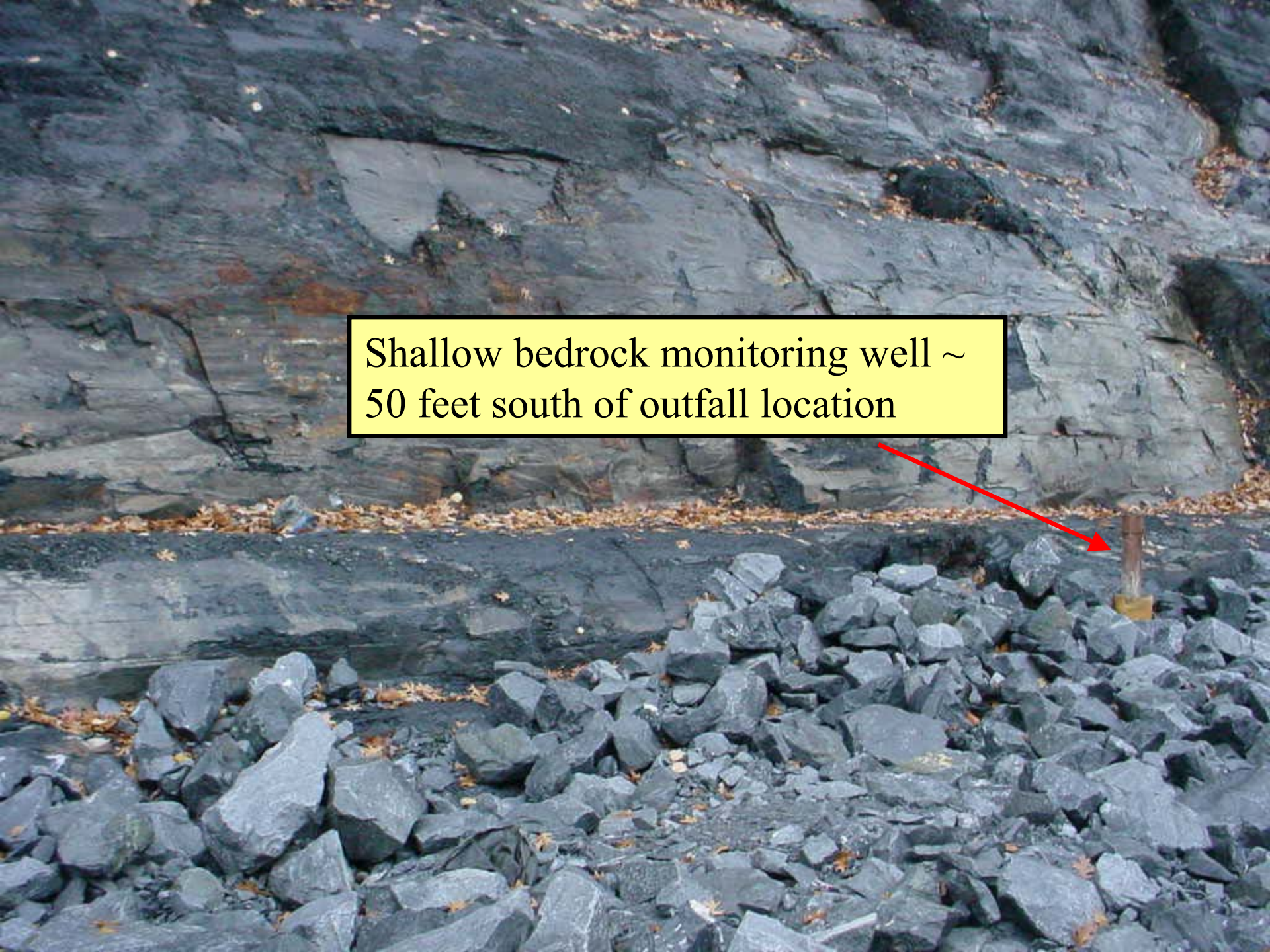

18 10:00 AM


Former outfall structure
DEERE


Former alignment of pipe from plant
Former outfall location
Shallow bedrock monitoring well


Oil release from bedrock at former outfall location


Shallow bedrock monitoring well
Stone riprap on shoreline access road


Shallow bedrock monitoring well ~
50 feet south of outfall location


Additional shallow bedrock monitoring wells south of former 004 outfall location

Schedule for Implementation

Operable Unit 4:

- Riverbank soils removal nearly completed
- 23,000 tons removed; estimated 3,000 tons of soil remaining to be removed from beneath stockpile area
- Completion of soil removal Summer 2004

Outstanding Issues to Address

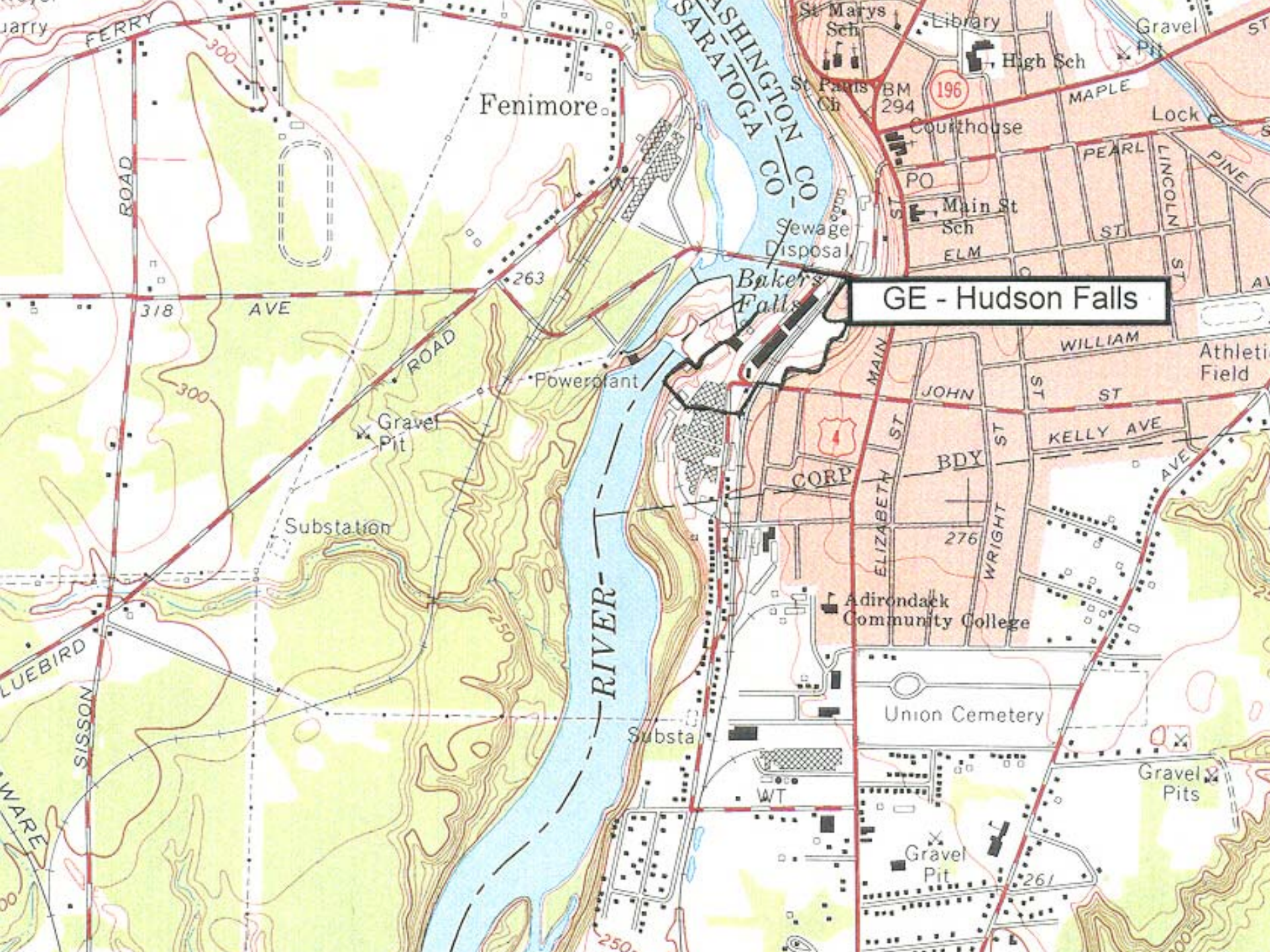
- During implementation of Operable Unit 4 remedy, PCB oil contamination in underlying bedrock discovered
- Extent of PCB oil in bedrock in this area is not yet defined
- Difficult to predict schedule at this time for remediation of this material

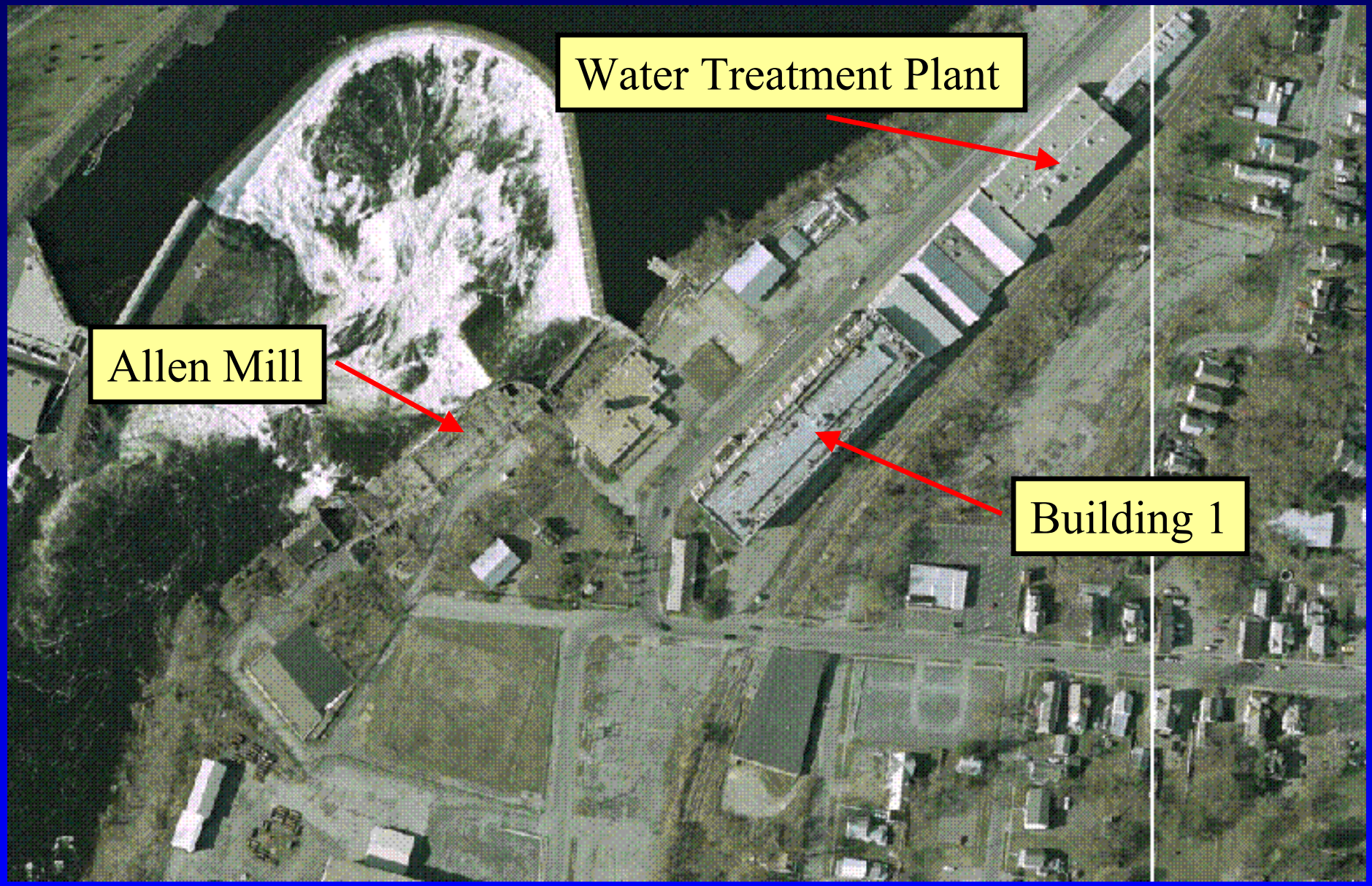
Remedial Program
GE Hudson Falls Plant Site

- Record of Decision (ROD) issued March 16, 2004
- ROD identifies selected remedies for overburden soils, and overburden/bedrock groundwater

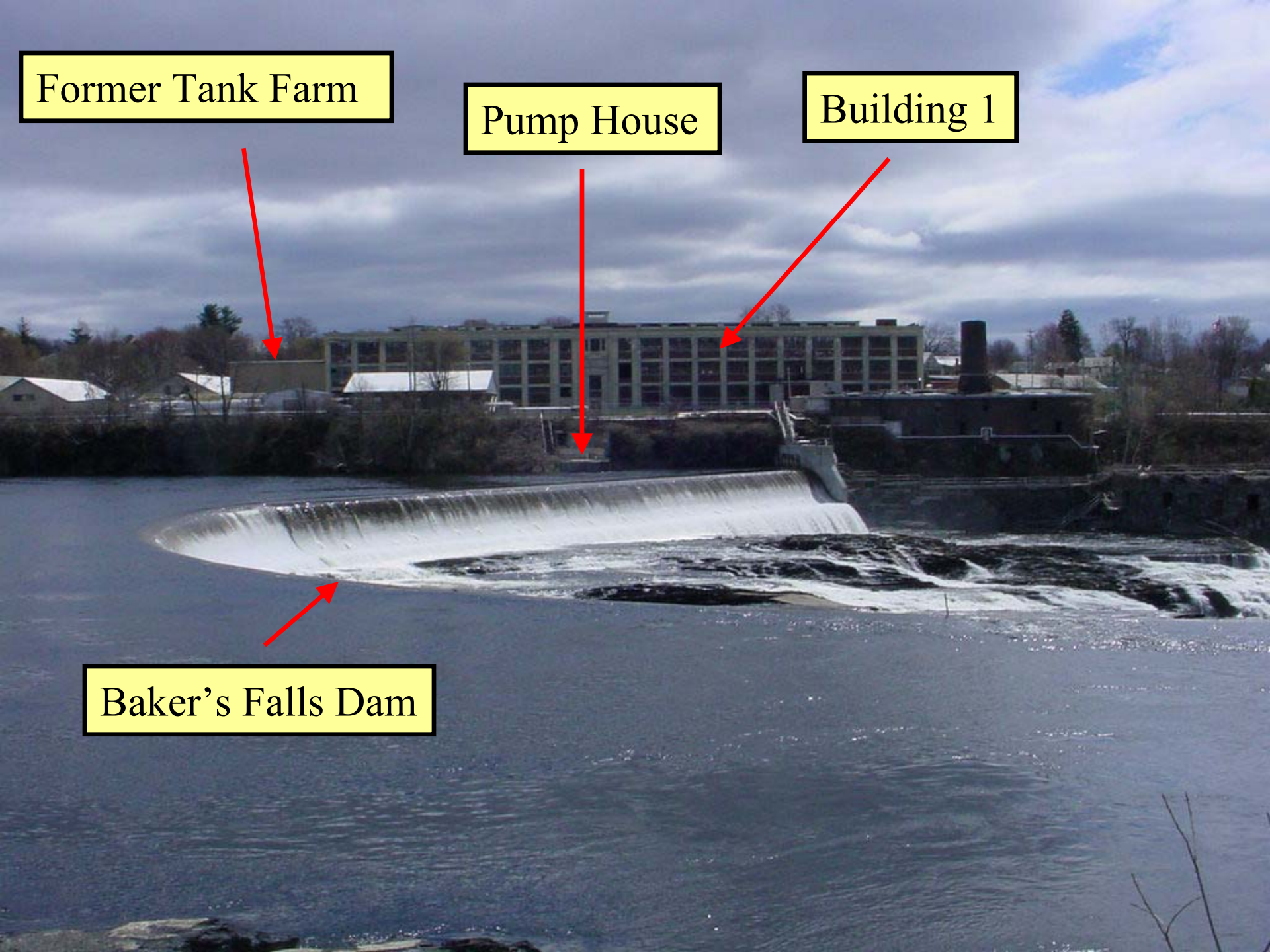
Site Location – GE Hudson Falls

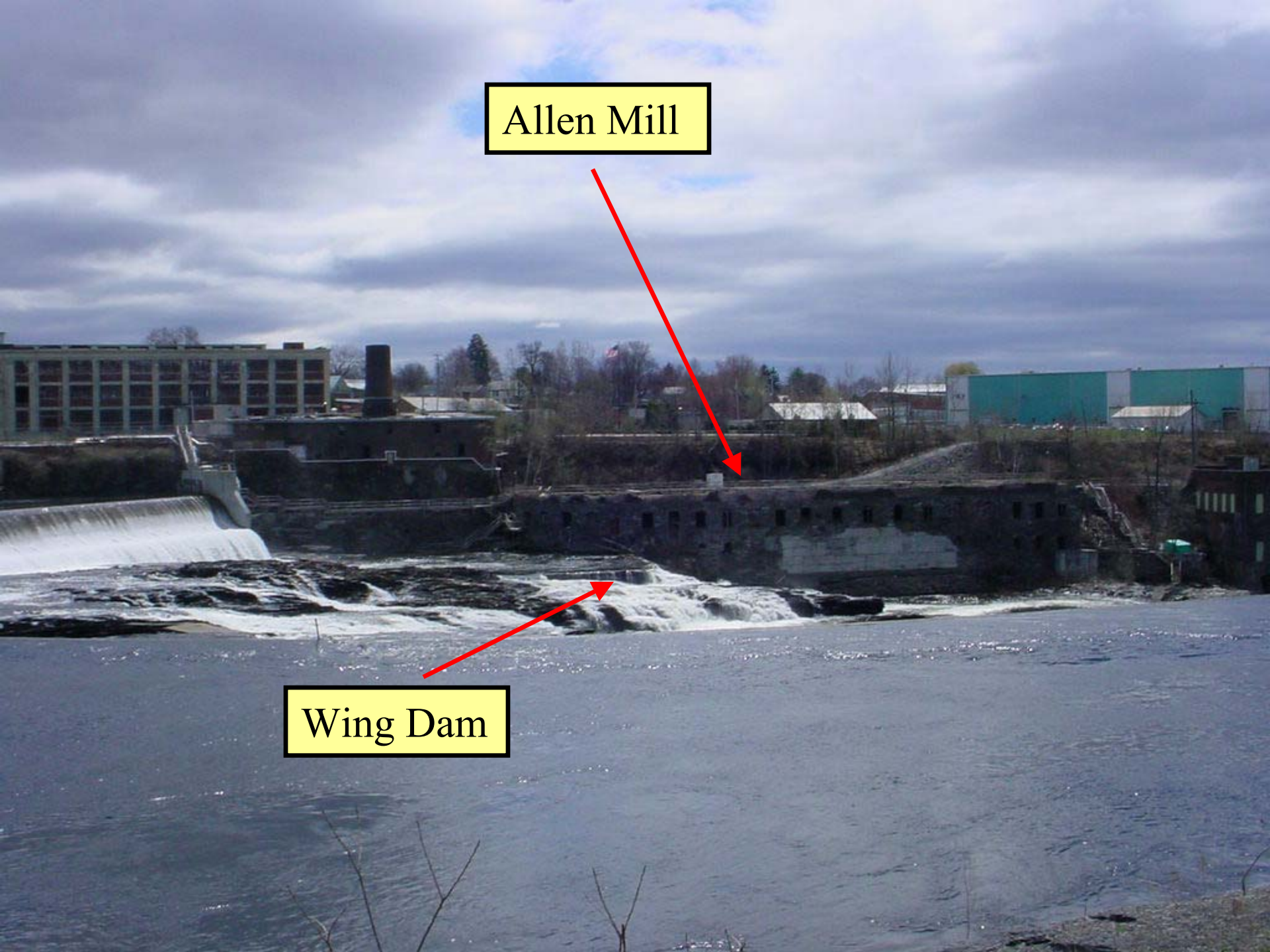
- Village of Hudson Falls, Town of Kingsbury, Washington County
- Located along Sumpter Street, between John Street and Bridge Street, west of Derby Street and Mosher Hill Road
- Bakers Falls on the Hudson River is to the west
- Rail line cuts across the site from south to north


GE - Hudson Falls
Fenimore
WASHINGTON CO
SARATOGA CO
RIVER
Baker's Falls
Sewage Disposal
Powerplant
Substation
Substa
Gravel Pit
Gravel Pits
St Marys Sch
Library
High Sch
St Paul's Ch
BM 294
Courthouse
PO
Main St Sch
Lock
MAPLE
PEARL
LINCOLN
PINE
ELM
WILLIAM
JOHN
KELLY AVE
MAIN
ELIZABETH
WRIGHT
CORP
BDY
Athletic Field
Adirondack Community College
Union Cemetery
WT
FERRY
ROAD
318
AVE
263
300
250
276
261
SISSON


Water Treatment Plant
Allen Mill
Building 1

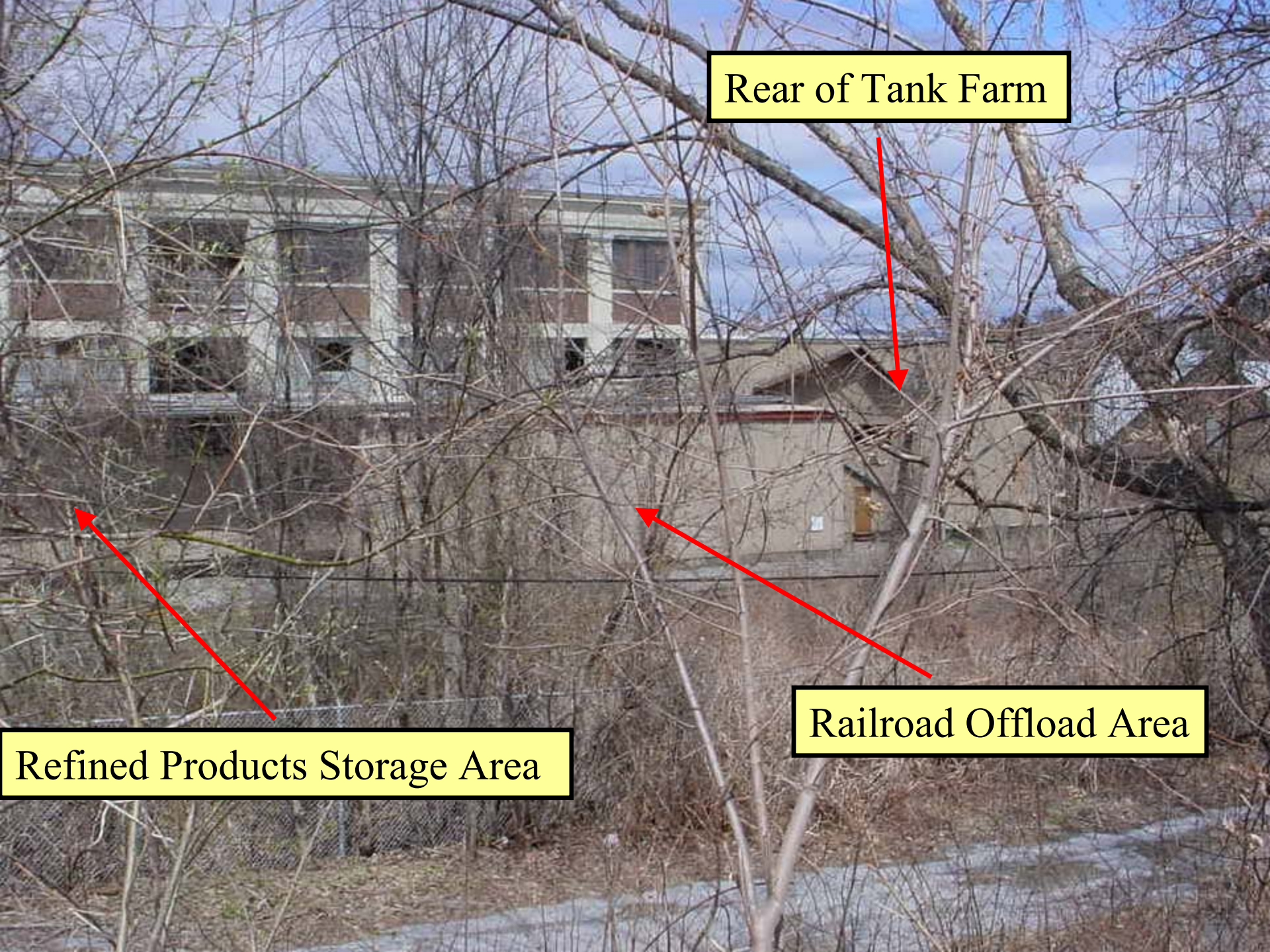

Water Treatment Plant
Fenimore Bridge


Former Tank Farm
Pump House
Building 1
Baker's Falls Dam


Allen Mill
Wing Dam


Water Treatment Plant


Rear of Building 1
Refined Products Storage Area

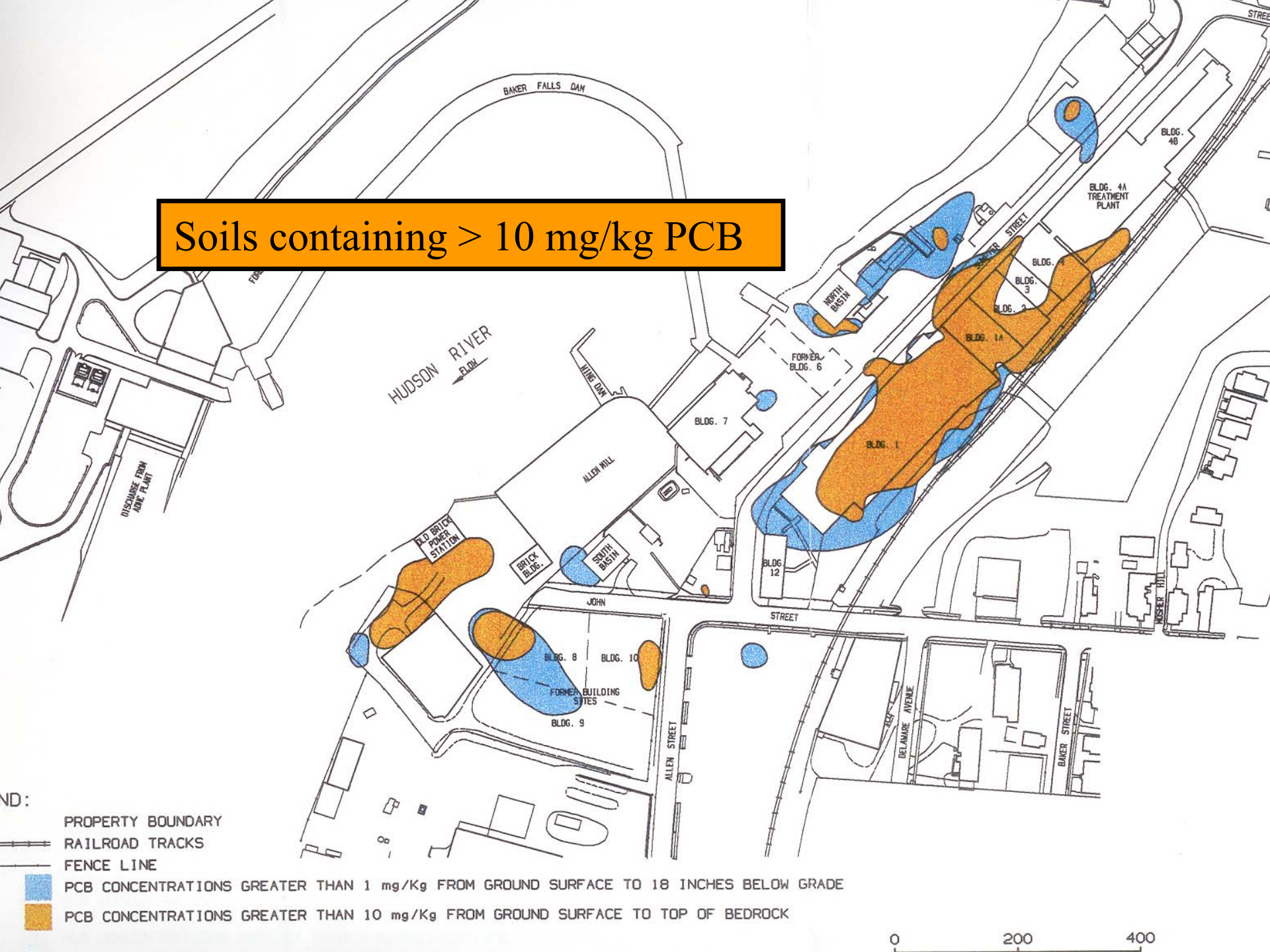

Rear of Tank Farm
Railroad Offload Area
Refined Products Storage Area

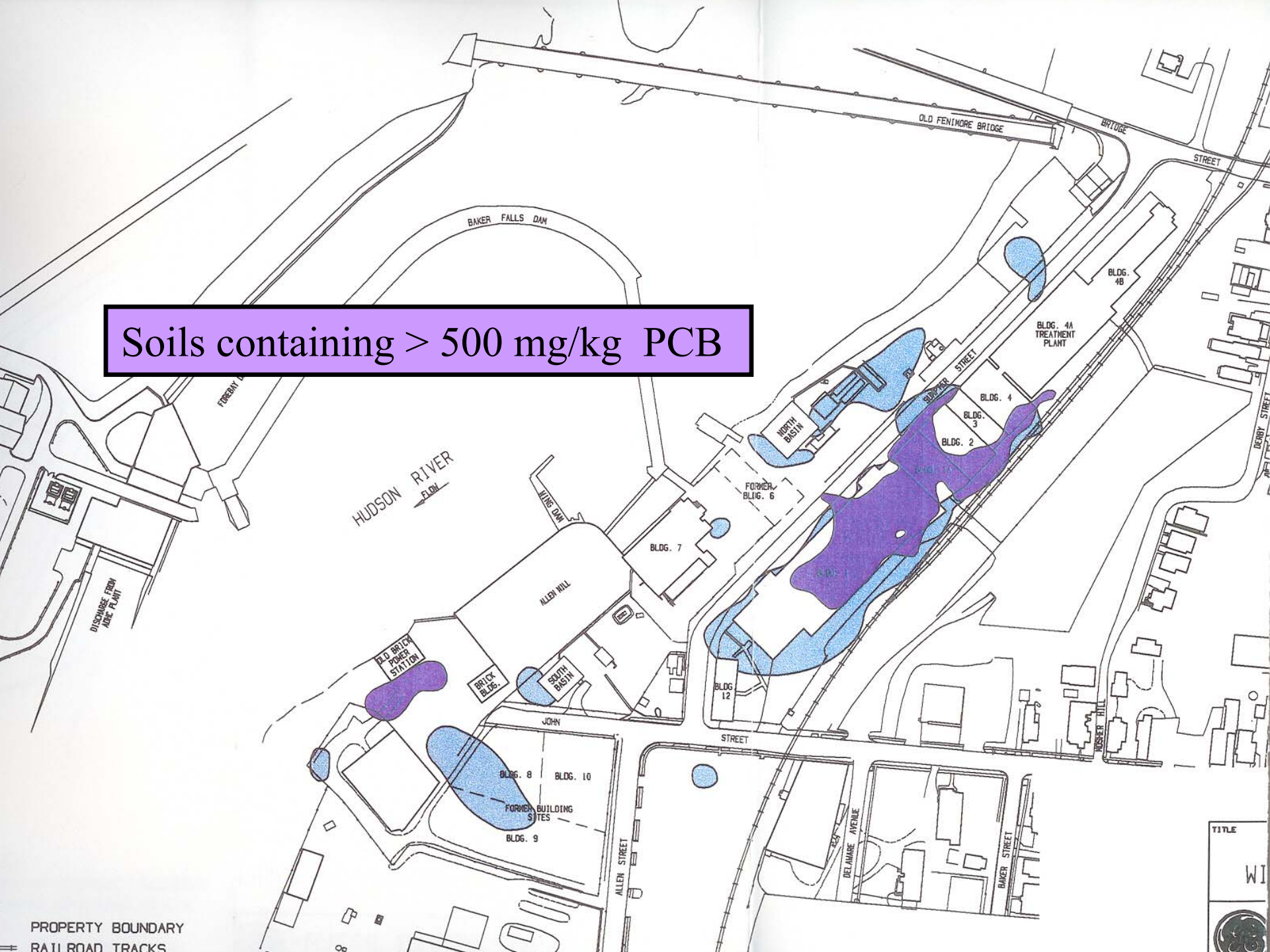
Site Background

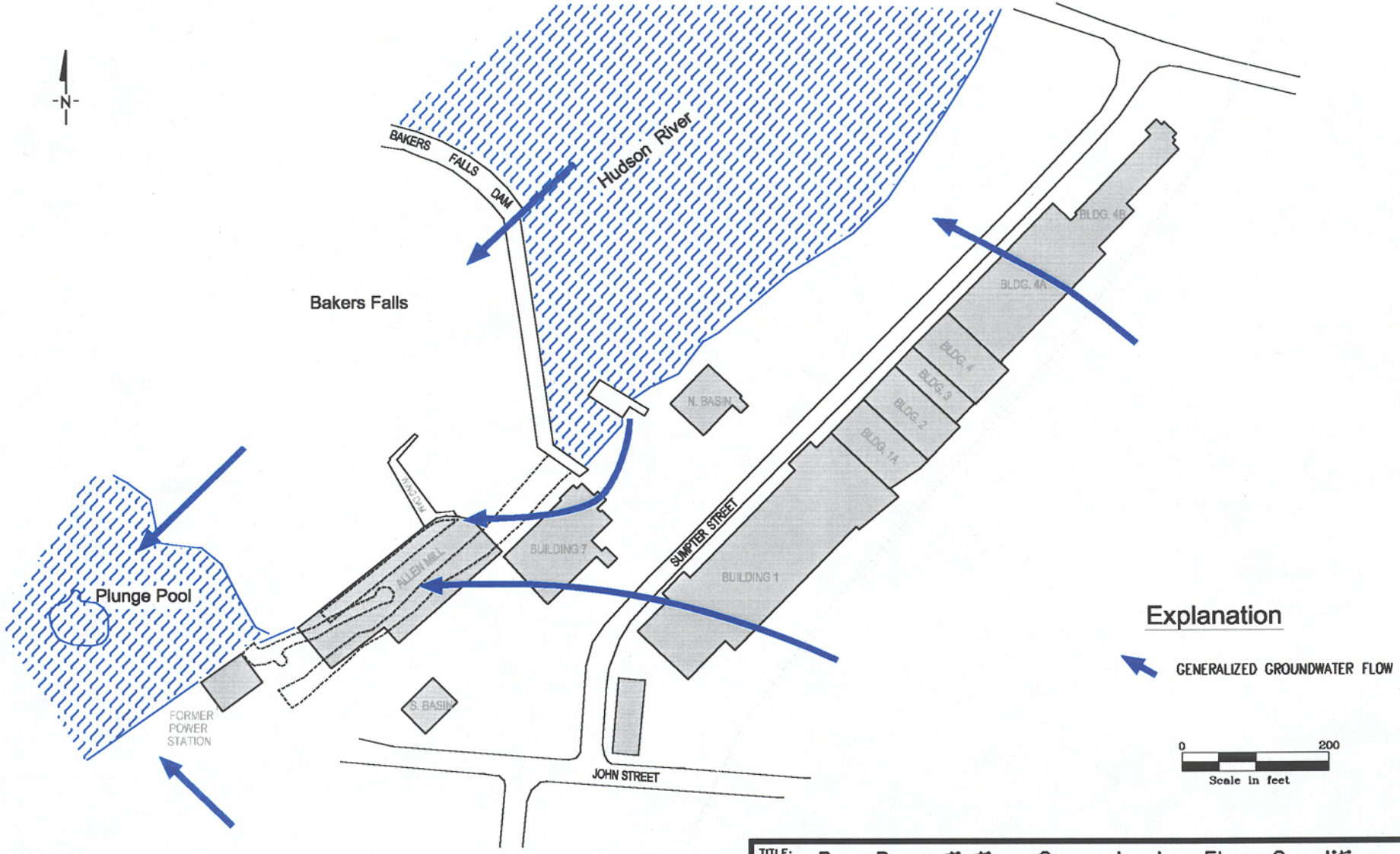
- Prior to 1952: Site used for paper industry
- 1952-1977: GE capacitor production using PCB as dielectric fluid
- 1977-1995: GE capacitor production using substitute dielectric fluids TCB, DEHP, PXE
- 1995-present: Plant operations ceased; remedial activities only

Results of the Remedial Investigation

- Extent of sediment and soil contamination defined
- Extent of overburden and bedrock groundwater contamination defined
- Nature of contamination defined
- Pathways of contamination migration defined


Soils containing > 10 mg/kg PCB
BAKER FALLS DAM
HUDSON RIVER
FLOW
DISCHARGE FROM ADMC PLANT
WING DAM
ALLEN MILL
OLD BRICK POWER STATION
BRICK BLDG.
SOUTH BASIN
NORTH BASIN
FORMER BLDG. 6
BLDG. 7
BLDG. 1
BLDG. 1A
BLDG. 2
BLDG. 3
BLDG. 4
BLDG. 4A TREATMENT PLANT
BLDG. 4B
BLDG 12
BLDG. 8
BLDG. 10
FORMER BUILDING SITES
BLDG. 9
JOHN STREET
ALLEN STREET
DELAWARE AVENUE
BAKER STREET
WASHER HILL
ND:
PROPERTY BOUNDARY
RAILROAD TRACKS
FENCE LINE
PCB CONCENTRATIONS GREATER THAN 1 mg/Kg FROM GROUND SURFACE TO 18 INCHES BELOW GRADE
PCB CONCENTRATIONS GREATER THAN 10 mg/Kg FROM GROUND SURFACE TO TOP OF BEDROCK
0
200
400


Soils containing > 500 mg/kg PCB
OLD FENIMORE BRIDGE
BRIDGE
STREET
BAKER FALLS DAM
FOREBAY
DISCHARGE FROM ADIRONDACK PLANT
HUDSON RIVER
FLOW
WING DAM
ALLEN HILL
BLDG. 7
FORMER BLDG. 6
NORTH BASIN
SUMMER STREET
BLDG. 4B
BLDG. 4A TREATMENT PLANT
BLDG. 4
BLDG. 3
BLDG. 2
DERBY STREET
OLD BRICK POWER STATION
BRICK BLDG.
SOUTH BASIN
BLDG. 12
JOHN
STREET
KOSHER HILL
BLDG. 8
BLDG. 10
FORMER BUILDING SITES
BLDG. 9
ALLEN STREET
DELAWARE AVENUE
BAKER STREET
PROPERTY BOUNDARY
RAILROAD TRACKS
TITLE
WI



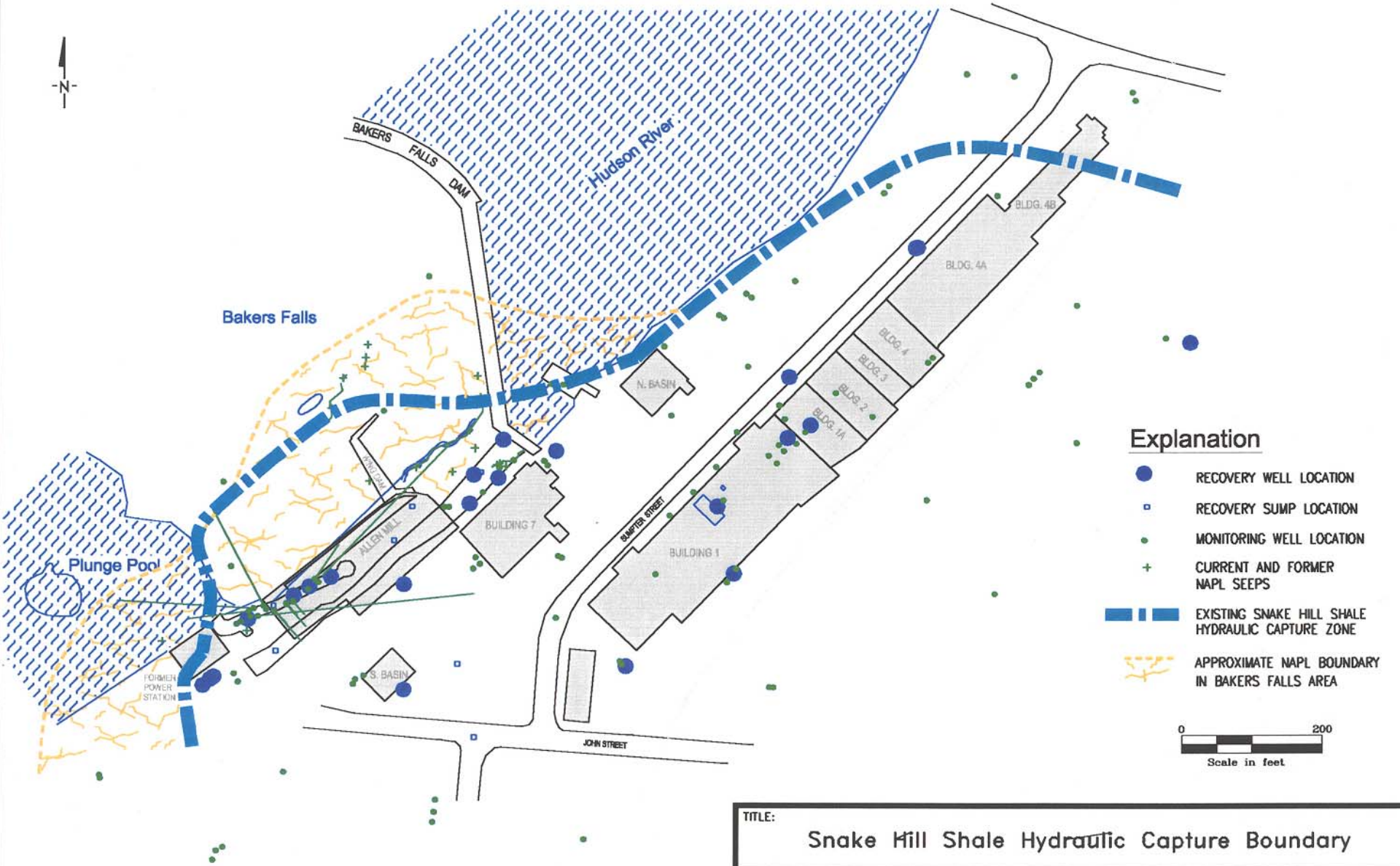
TITLE: Pre-Remediation Groundwater Flow Conditions in the Snake Hill Shale

LOCATION: GE Hudson Falls

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	AEB
DRAFTED	RMK
FILE	fs-Pre-Remd.dwg
DATE	3/2/01

FIGURE 2-7



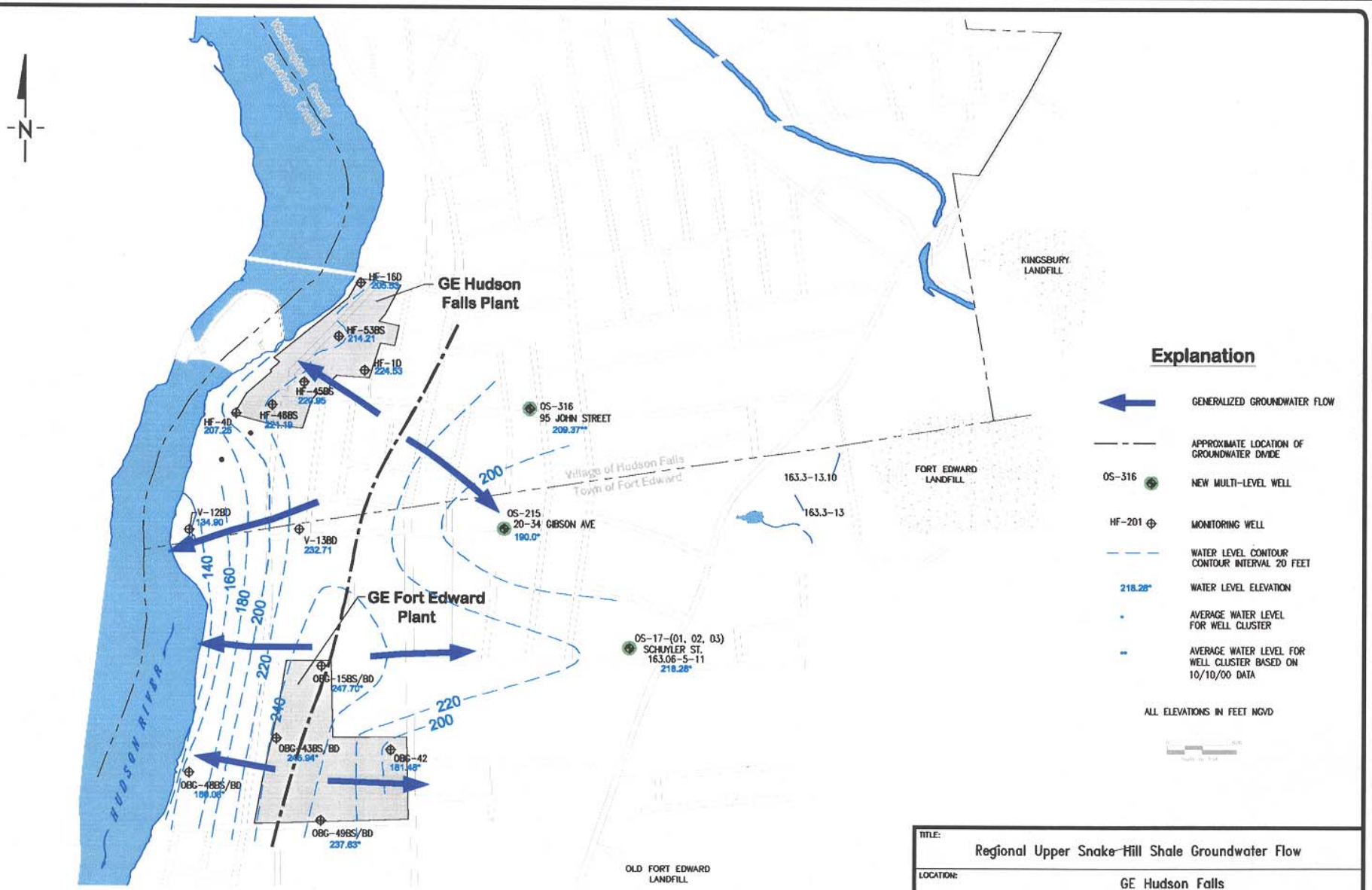
TITLE: Snake Hill Shale Hydraulic Capture Boundary

LOCATION: GE Hudson Falls

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	AEB
DRAFTED	RMK
FILE	R1-Capt-Brd.dwg
DATE	3/2/01

FIGURE: 2-8



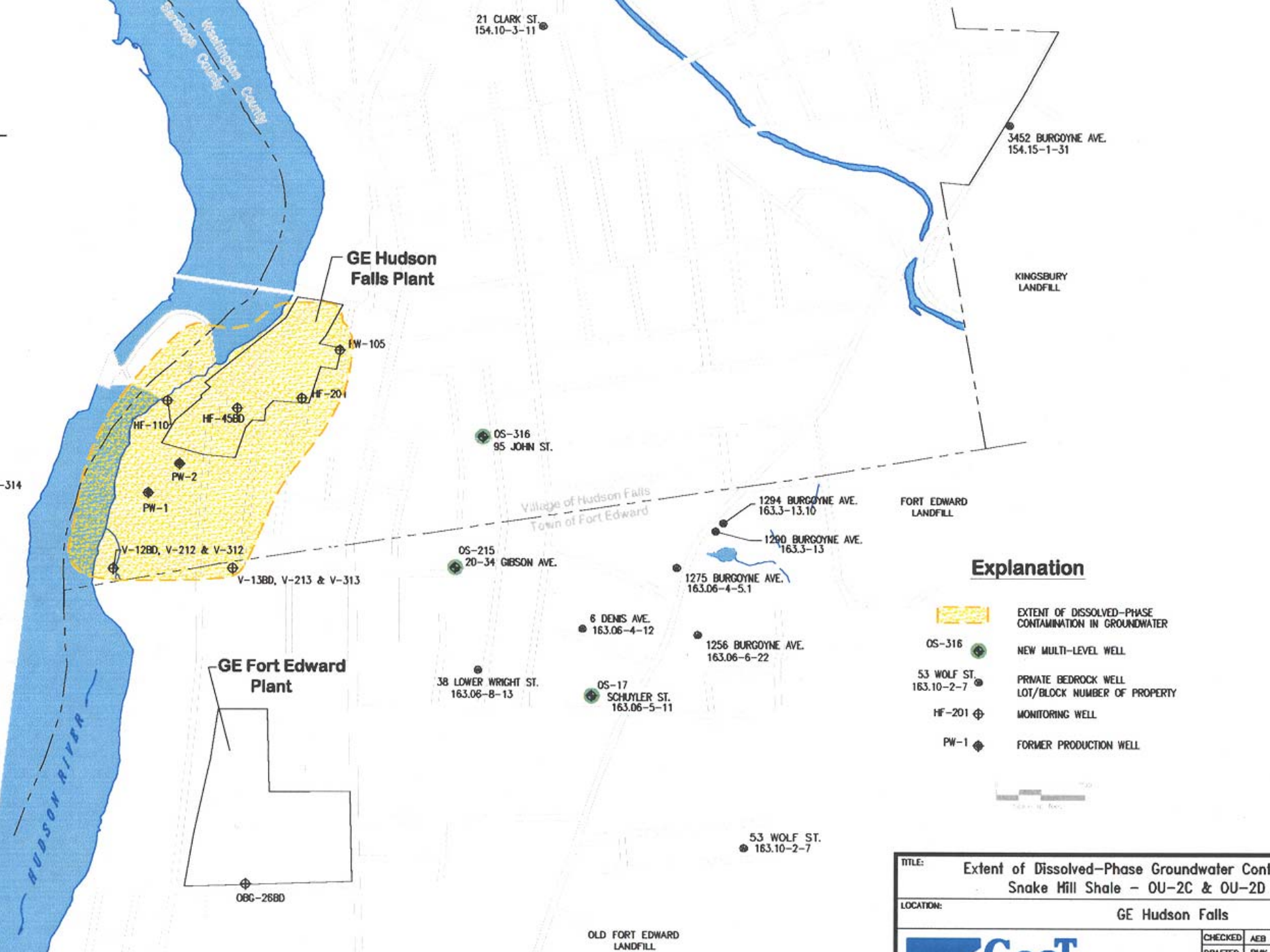
TITLE: Regional Upper Snake Hill Shale Groundwater Flow

LOCATION: GE Hudson Falls

GeoTrans, Inc.

CHECKED	AEB
DRAFTED	RMK
FILE	fe2-REG-WL.dwg
DATE	3/2/01

FIGURE: 2-9


21 CLARK ST.
154.10-3-11
3452 BURGOYNE AVE.
154.15-1-31
KINGSBURY LANDFILL
GE Hudson Falls Plant
HW-105
HF-201
HF-110
HF-458D
PW-2
PW-1
V-12BD, V-212 & V-312
V-13BD, V-213 & V-313
OS-316
95 JOHN ST.
Village of Hudson Falls
Town of Fort Edward
1294 BURGOYNE AVE.
163.3-13.10
1290 BURGOYNE AVE.
163.3-13
FORT EDWARD LANDFILL
OS-215
20-34 GIBSON AVE.
1275 BURGOYNE AVE.
163.06-4-5.1
6 DENIS AVE.
163.06-4-12
1256 BURGOYNE AVE.
163.06-6-22
38 LOWER WRIGHT ST.
163.06-8-13
OS-17
SCHUYLER ST.
163.06-5-11
GE Fort Edward Plant
OBG-26BD
53 WOLF ST.
163.10-2-7
OLD FORT EDWARD LANDFILL
HUDSON RIVER
Washington County
Saratoga County
Explanation
EXTENT OF DISSOLVED-PHASE CONTAMINATION IN GROUNDWATER
OS-316 NEW MULTI-LEVEL WELL
53 WOLF ST. 163.10-2-7 PRIVATE BEDROCK WELL LOT/BLOCK NUMBER OF PROPERTY
HF-201 MONITORING WELL
PW-1 FORMER PRODUCTION WELL
TITLE: Extent of Dissolved-Phase Groundwater Cont
Snake Hill Shale - OU-2C & OU-2D
LOCATION: GE Hudson Falls
CHECKED AEB

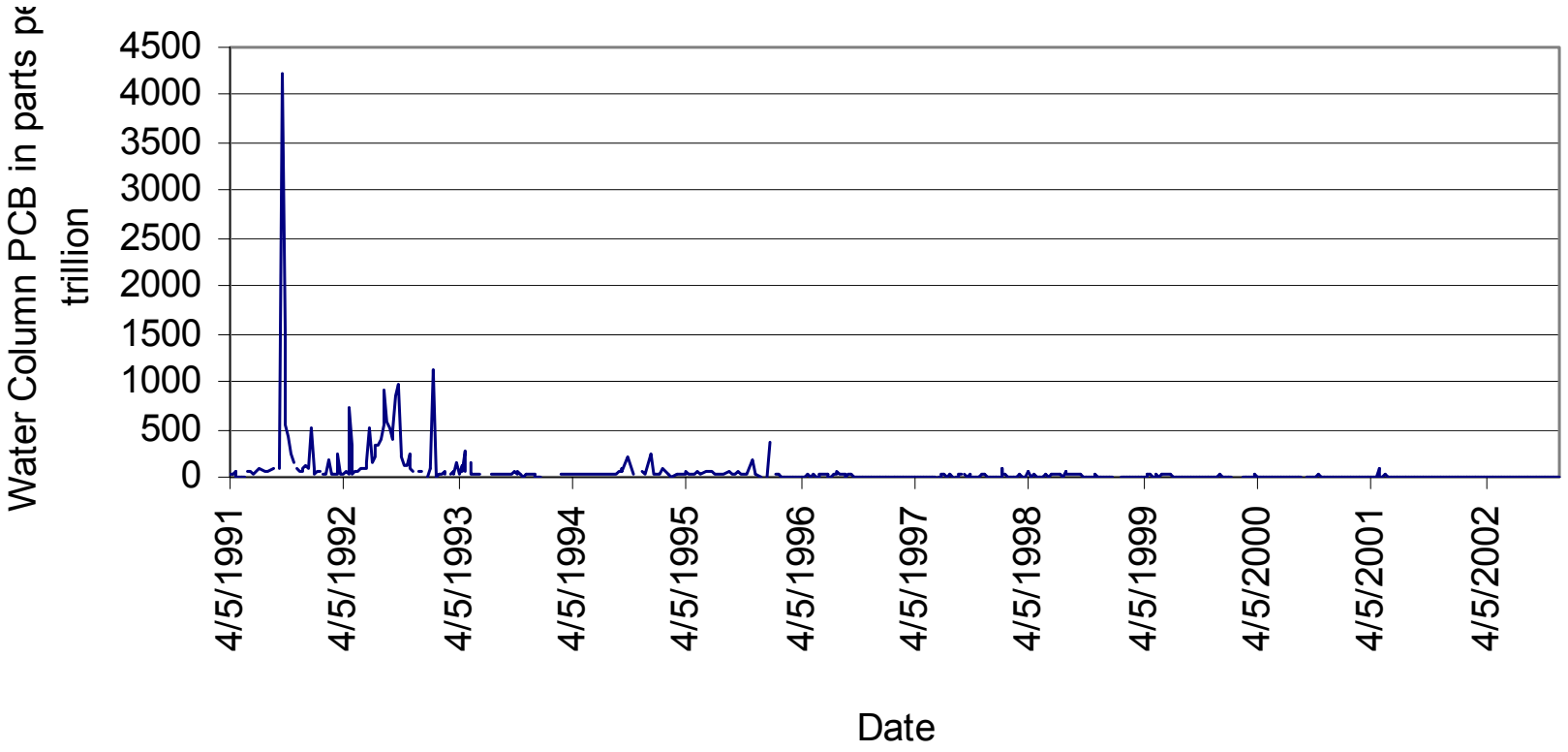
Interim Remedial Measures (IRMs)

- Sediment removal from the eastern raceway, lower raceway, tailrace tunnel, pump house area
- Seepage collection in the Allen Mill raceways, tailrace tunnel, and on Baker's Falls
- Installation and operation of a overburden and bedrock groundwater and PCB oil recovery system
- Construction of a new state-of-the-art wastewater treatment system to manage all waters generated at the site
- Removal of large volume of PCB oil and sludge from beneath Building 1

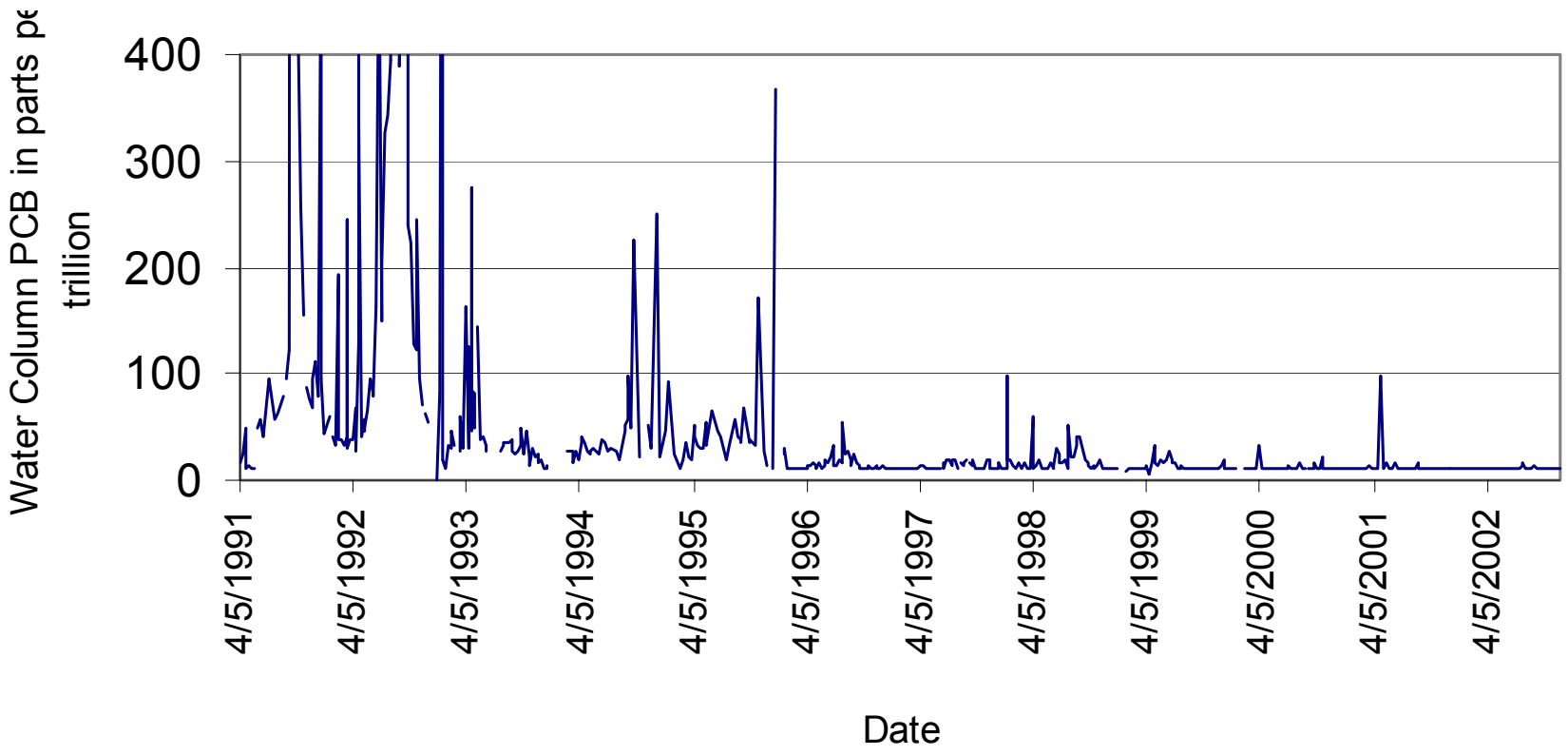
Result of IRM Implementation

- Removal of an estimated 135 tons of PCB
- Significant reduction in PCB concentrations in Hudson River directly attributable to the site

Water Column PCB at Roger's Island since 1991 (GE Data)



Water Column PCB at Roger's Island since 1991 (GE Data)



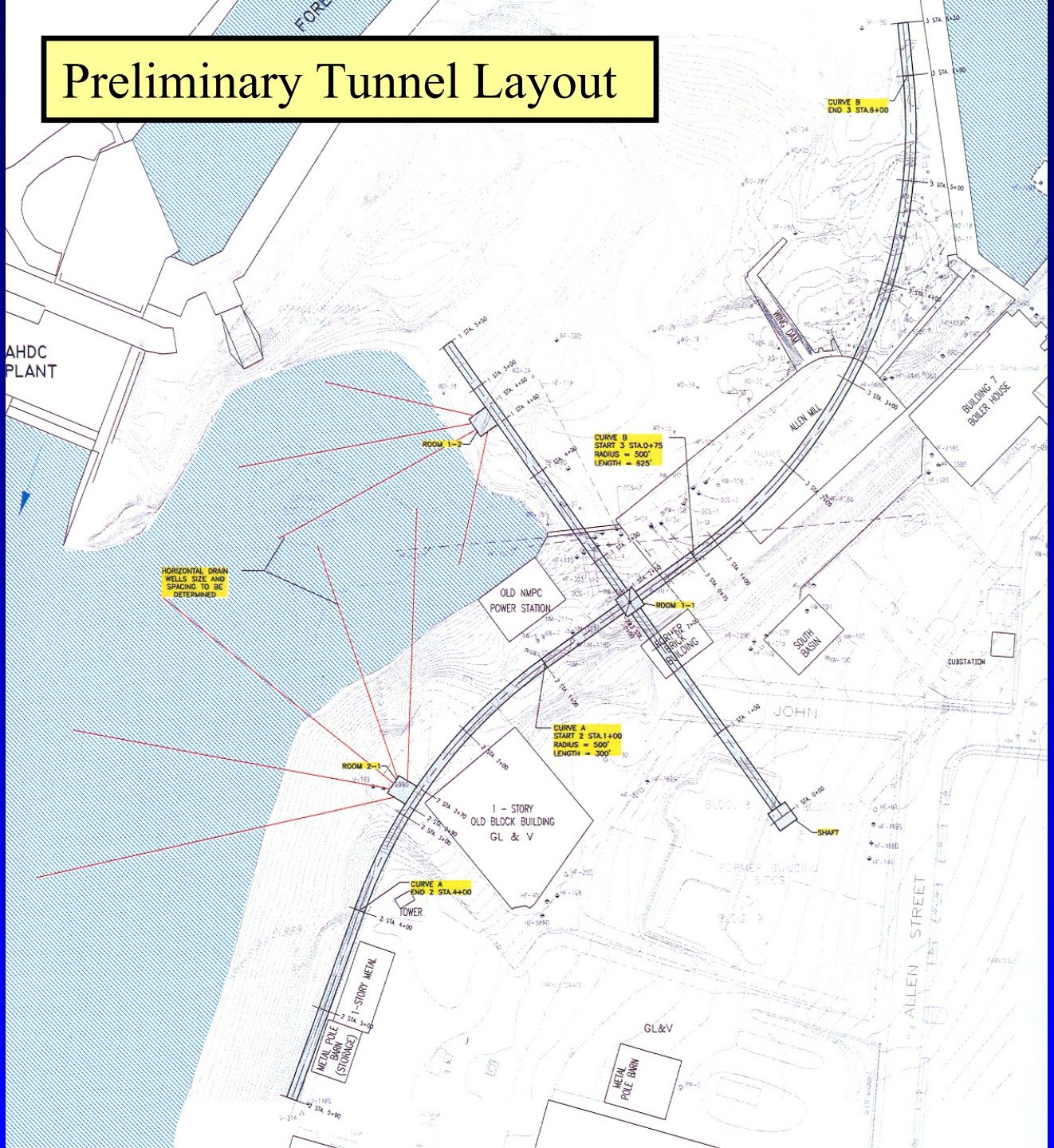
Soil Remedy: Treatment/Disposal

- Building decommissioning and demolition
- Soil treatment and/or disposal, with cleanup level determined to be protective of groundwater
- Treatment technologies to be selected in design
- Monitoring program
- Institutional controls

Groundwater Remedy: Enhance Existing Remedial System with Tunnel and Drain System

- Install and operate a tunnel and drain system along the western boundary of the site to supplement the existing system
- Expand the existing wastewater treatment plant from 125 to 250 gallons per minute
- Monitoring program and institutional controls

Preliminary Tunnel Layout



Schedule for Implementation GE Hudson Falls

- Soils remedy – estimated duration of two years for design and construction activities; may be an additional year for design studies
- Groundwater / PCB oil remedy – estimated duration of two years for design and construction activities

Document Repositories

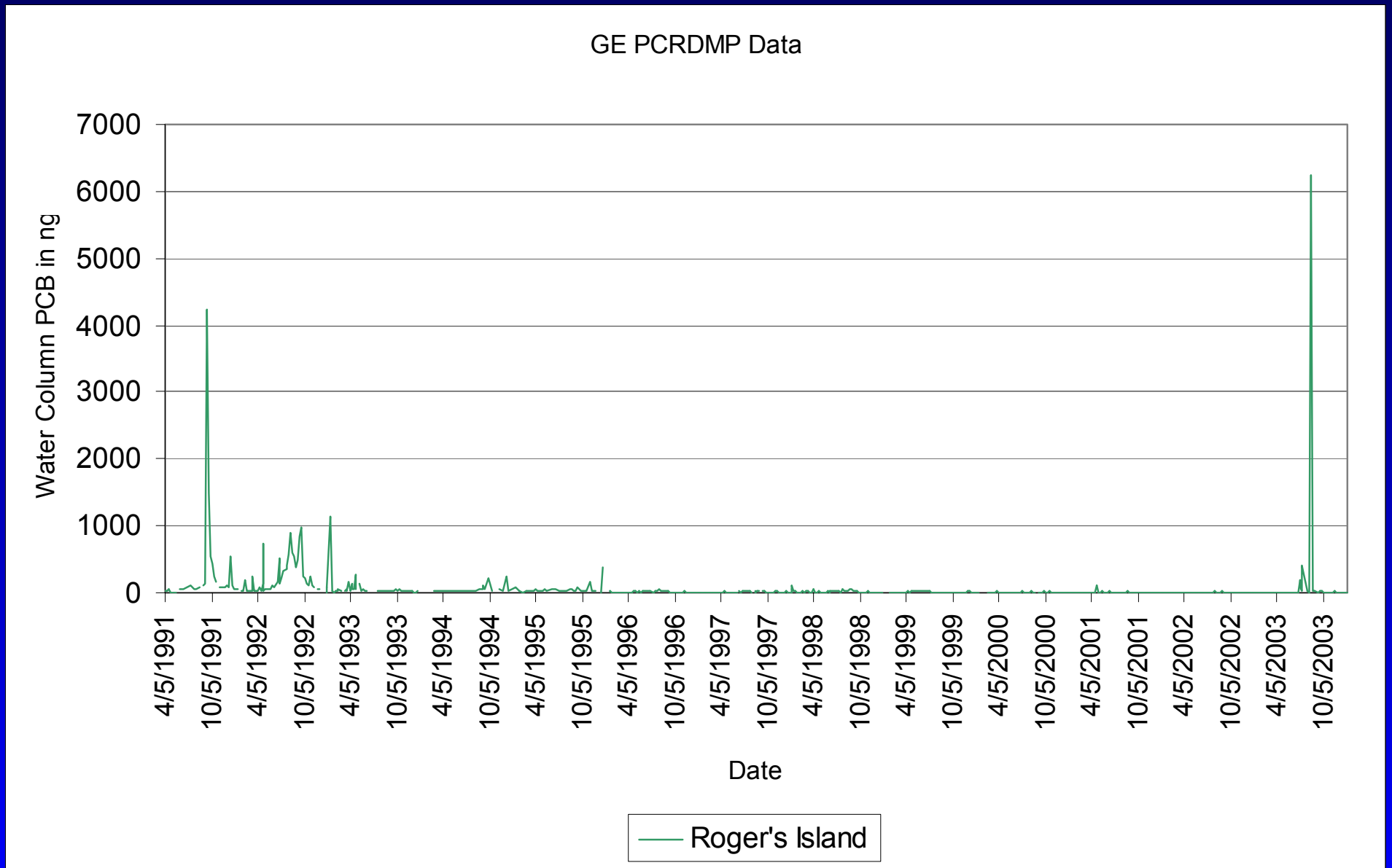
- Location of Documents for the GE Hudson Falls and Fort Edward Plant Sites:

NYSDEC Central Office
625 Broadway, 11th Floor
Albany, NY 12233-7010

Washington County Clerk's Office
383 Upper Broadway
Fort Edward, NY

Adriance Public Library
93 Market Street
Poughkeepsie, NY

NYSDEC Region 5 Office
Hudson Street
Warrensburg, NY


GE PCRDMP Data
Water Column PCB in ng
7000
6000
5000
4000
3000
2000
1000
0
4/5/1991
10/5/1991
4/5/1992
10/5/1992
4/5/1993
10/5/1993
4/5/1994
10/5/1994
4/5/1995
10/5/1995
4/5/1996
10/5/1996
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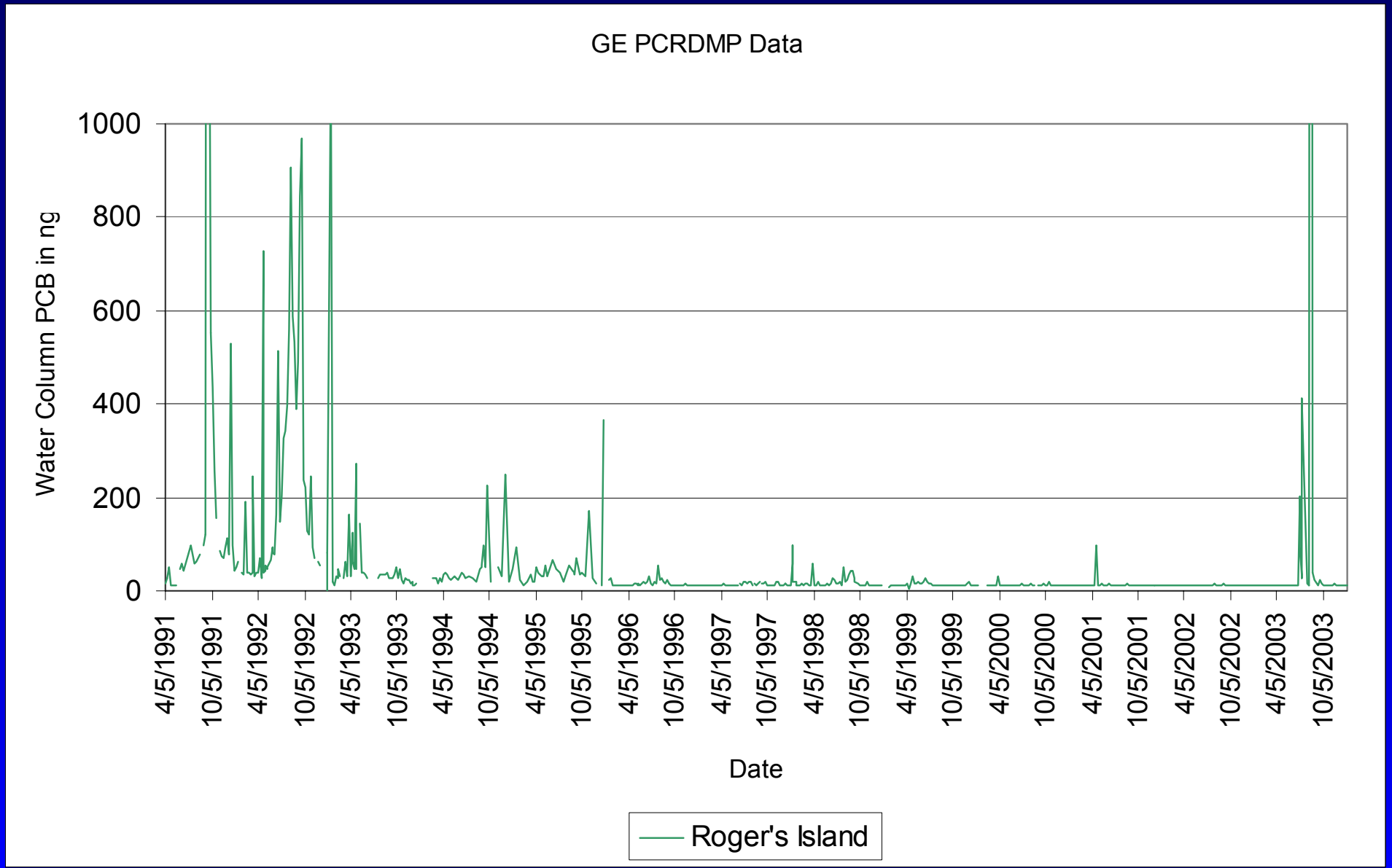
4/5/2001
10/5/2001
4/5/2002
10/5/2002
4/5/2003
10/5/2003
Date
Roger's Island


GE PCRDMP Data
Water Column PCB in ng
1000
800
600
400
200
0
4/5/1991
10/5/1991
4/5/1992
10/5/1992
4/5/1993
10/5/1993
4/5/1994
10/5/1994
4/5/1995
10/5/1995
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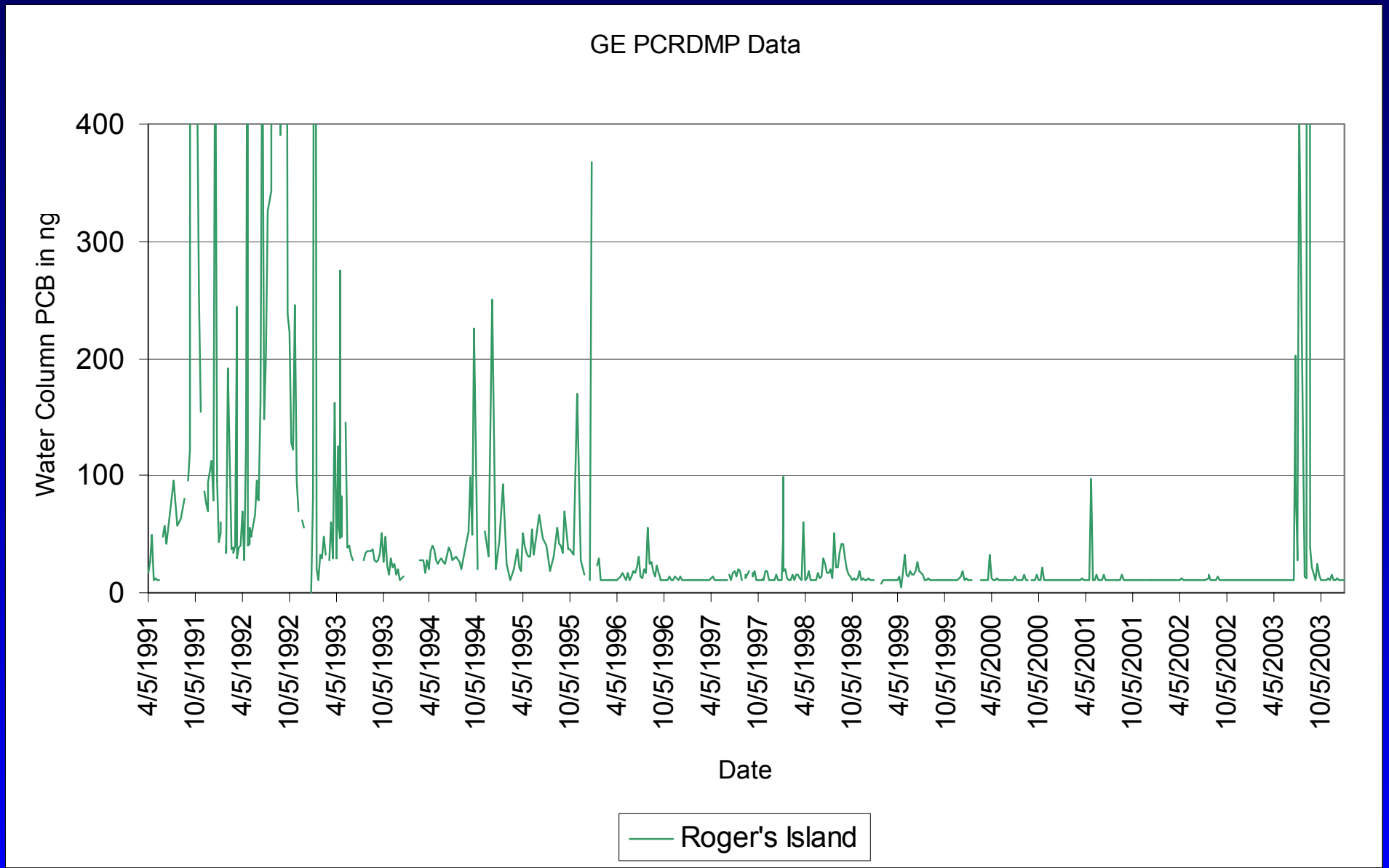
10/5/2003
Date
Roger's Island


GE PCRDMP Data
Water Column PCB in ng
400
300
200
100
0
4/5/1991
10/5/1991
4/5/1992
10/5/1992
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10/5/1993
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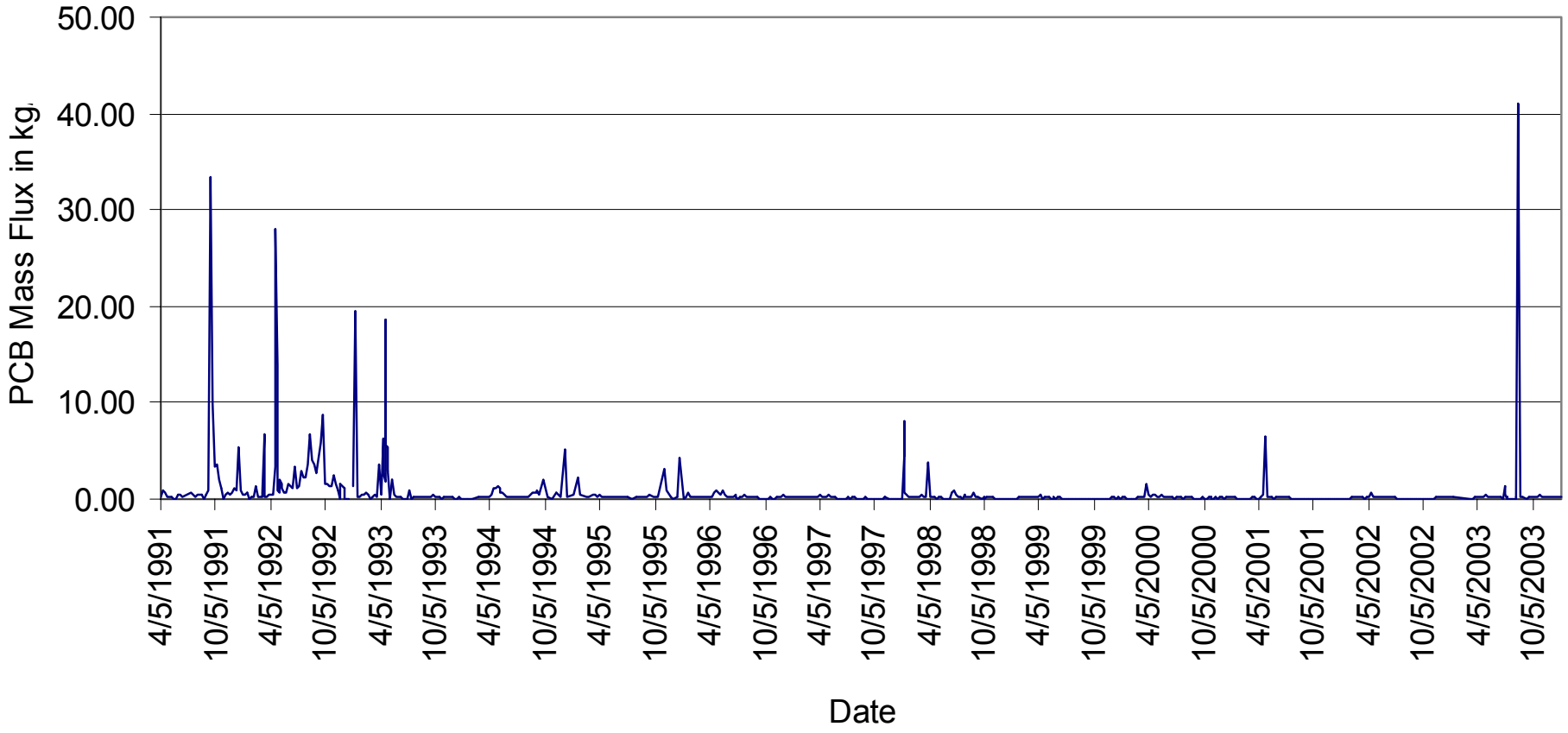
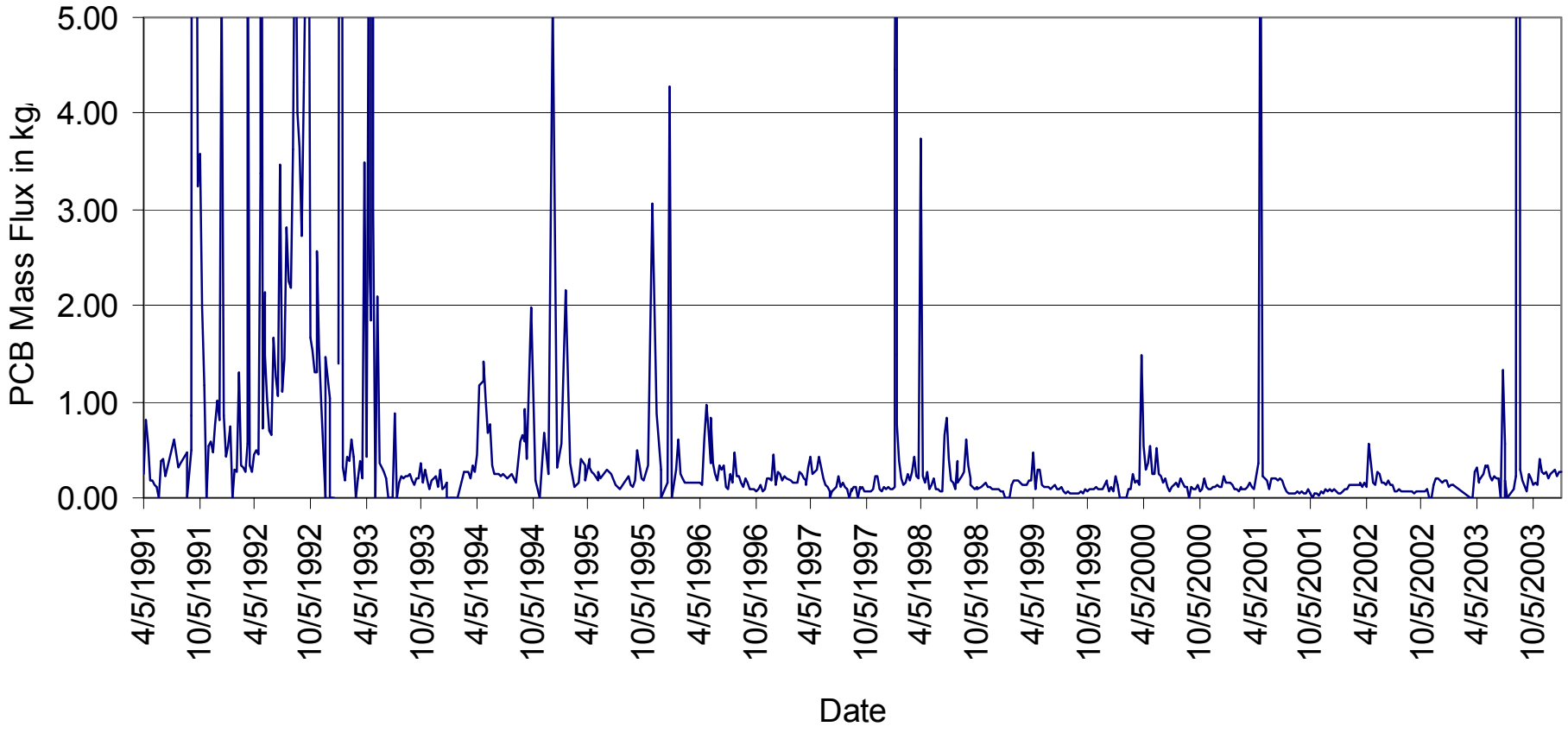
4/5/2003
10/5/2003
Date
Roger's Island

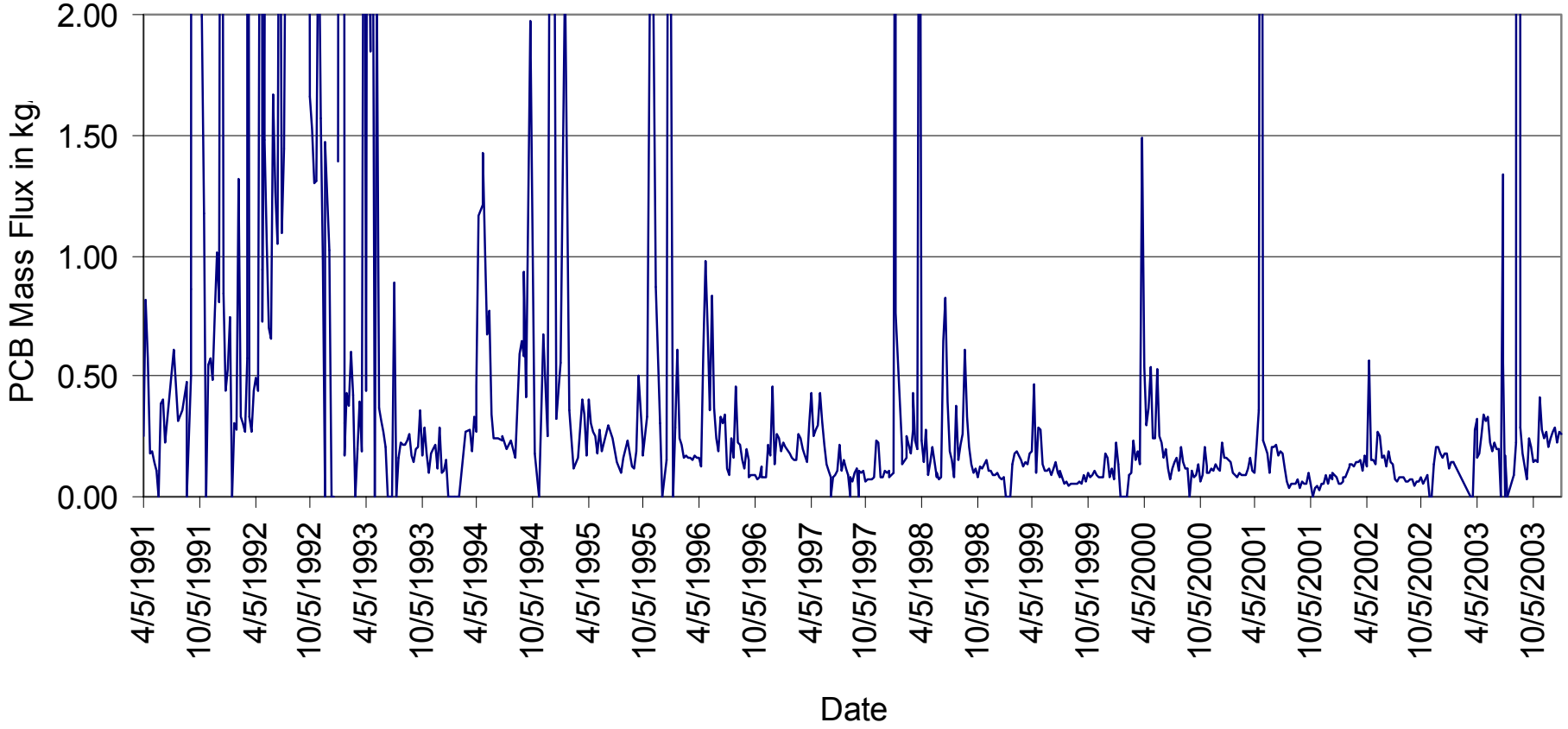
Hudson River PCB mass flux in kilograms per day at Roger's Island

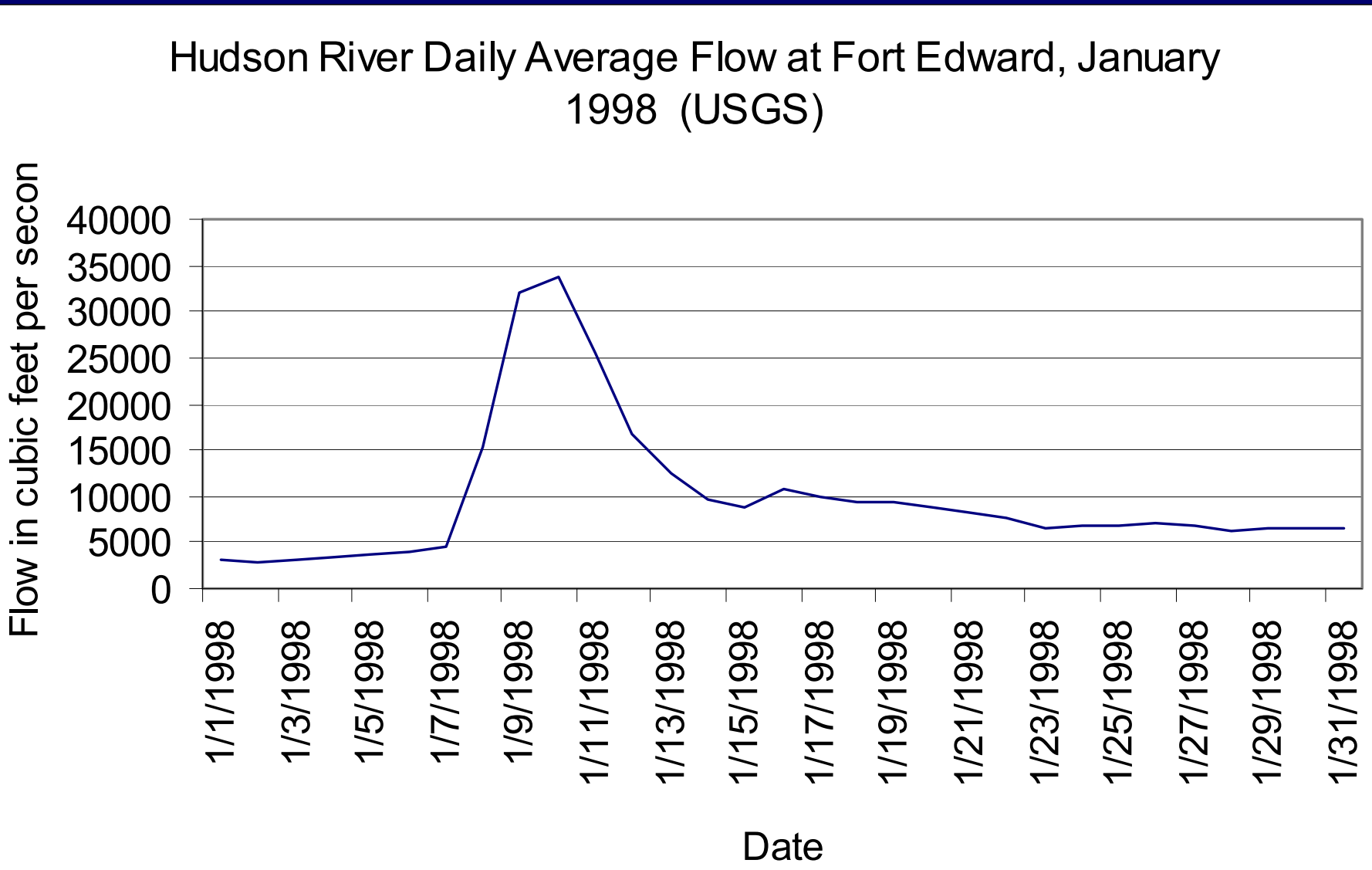


Hudson River PCB mass flux in kilograms per day at Roger's Island

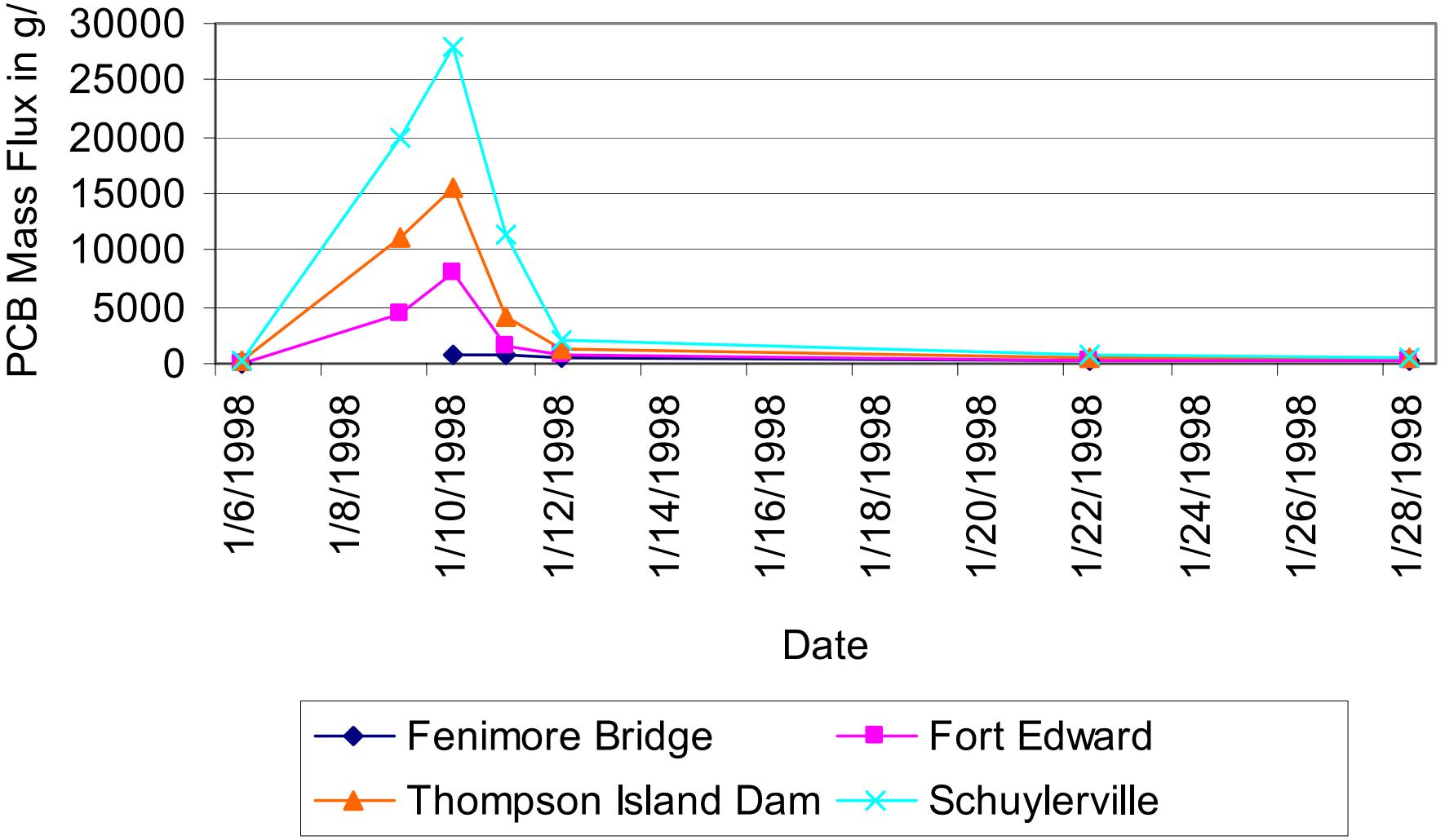


Hudson River PCB mass flux in kilograms per day at Roger's Island

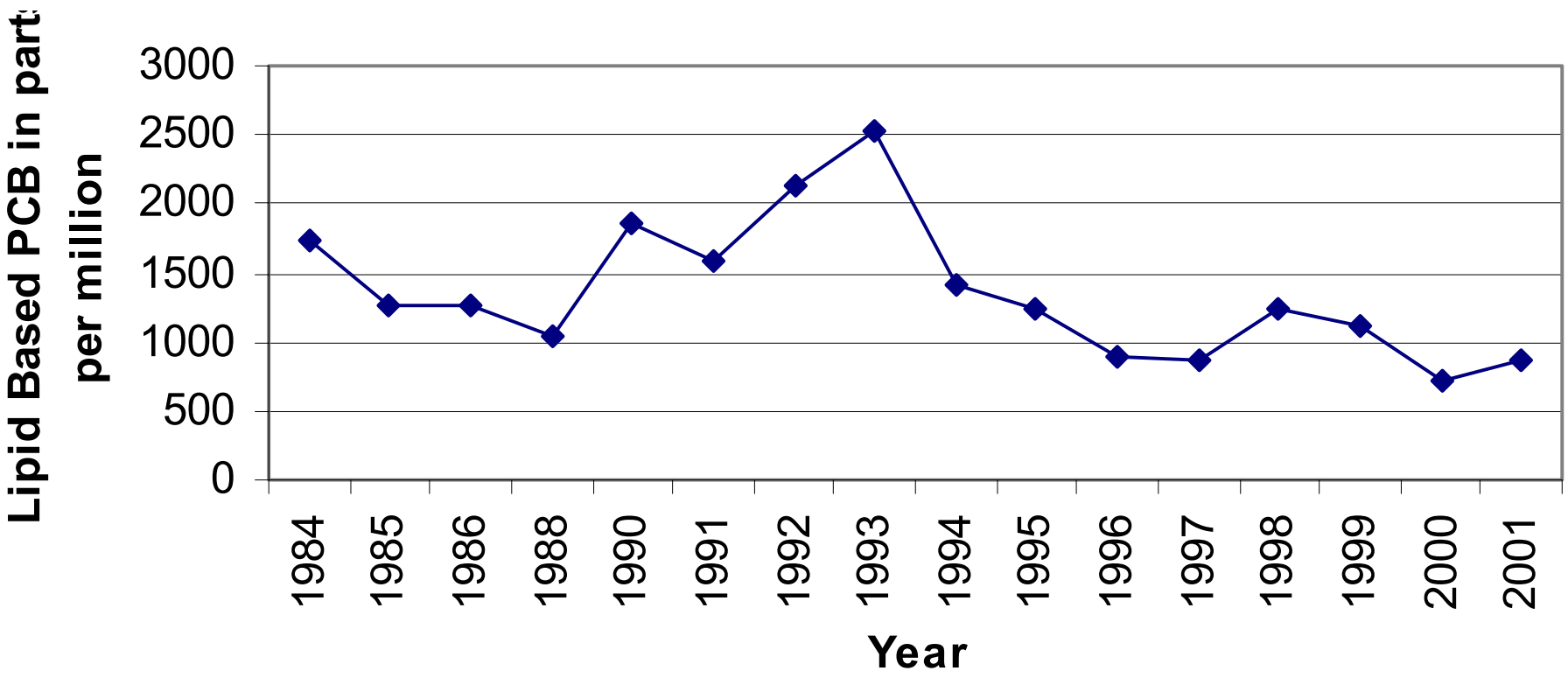


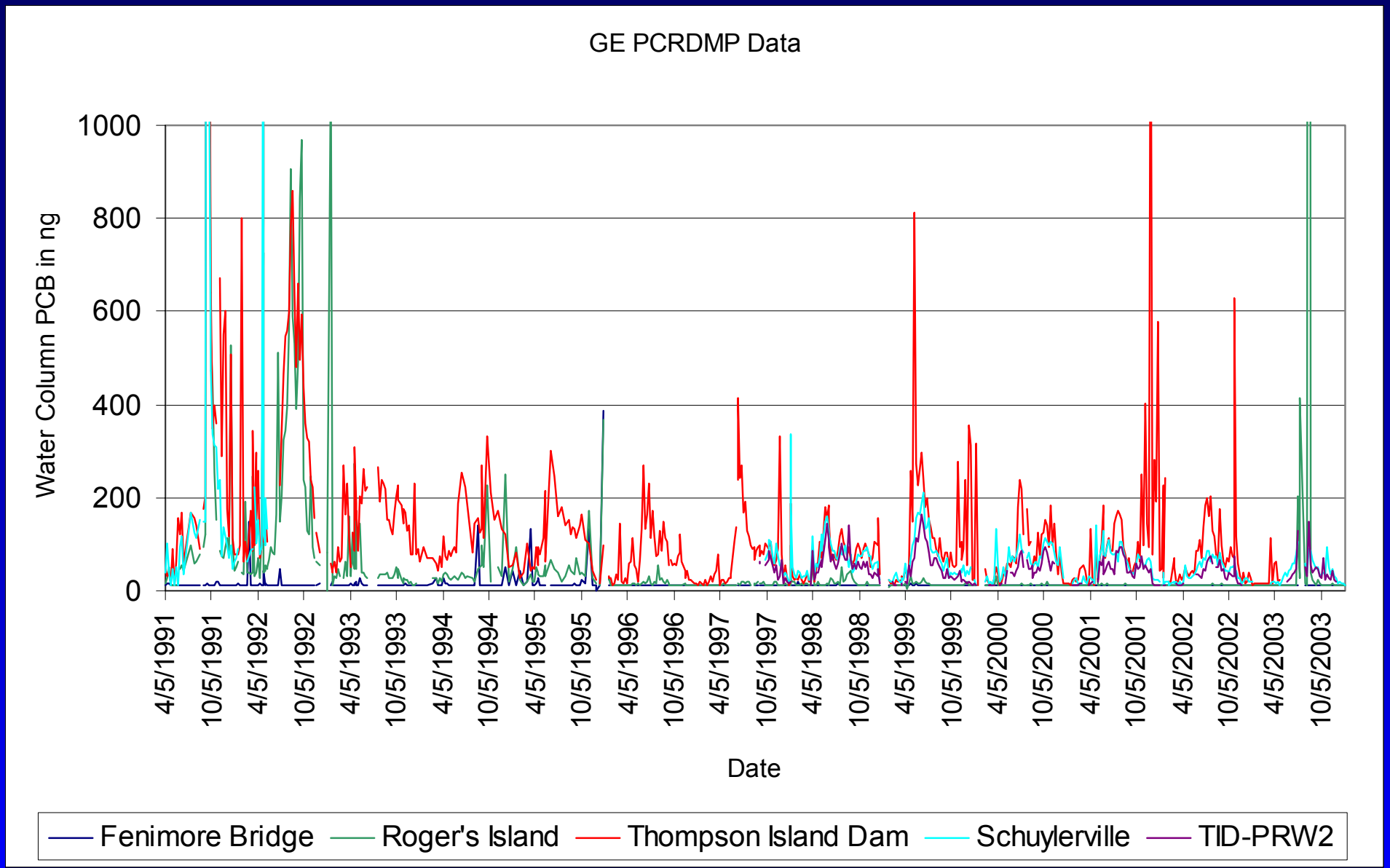

Hudson River Daily Average Flow at Fort Edward, January 1998 (USGS)
Flow in cubic feet per secon
40000
35000
30000
25000
20000
15000
10000
5000
0
1/1/1998
1/3/1998
1/5/1998
1/7/1998
1/9/1998
1/11/1998
1/13/1998
1/15/1998
1/17/1998
1/19/1998
1/21/1998
1/23/1998
1/25/1998
1/27/1998
1/29/1998
1/31/1998
Date

PCB Mass Flux in the Upper Hudson River, January 1998



Mean Lipid Based PCB in Largemouth Bass at Griffin Island




GE PCRDMP Data
Water Column PCB in ng
1000
800
600
400
200
0
4/5/1991
10/5/1991
4/5/1992
10/5/1992
4/5/1993
10/5/1993
4/5/1994
10/5/1994
4/5/1995
10/5/1995
4/5/1996
10/5/1996
4/5/1997
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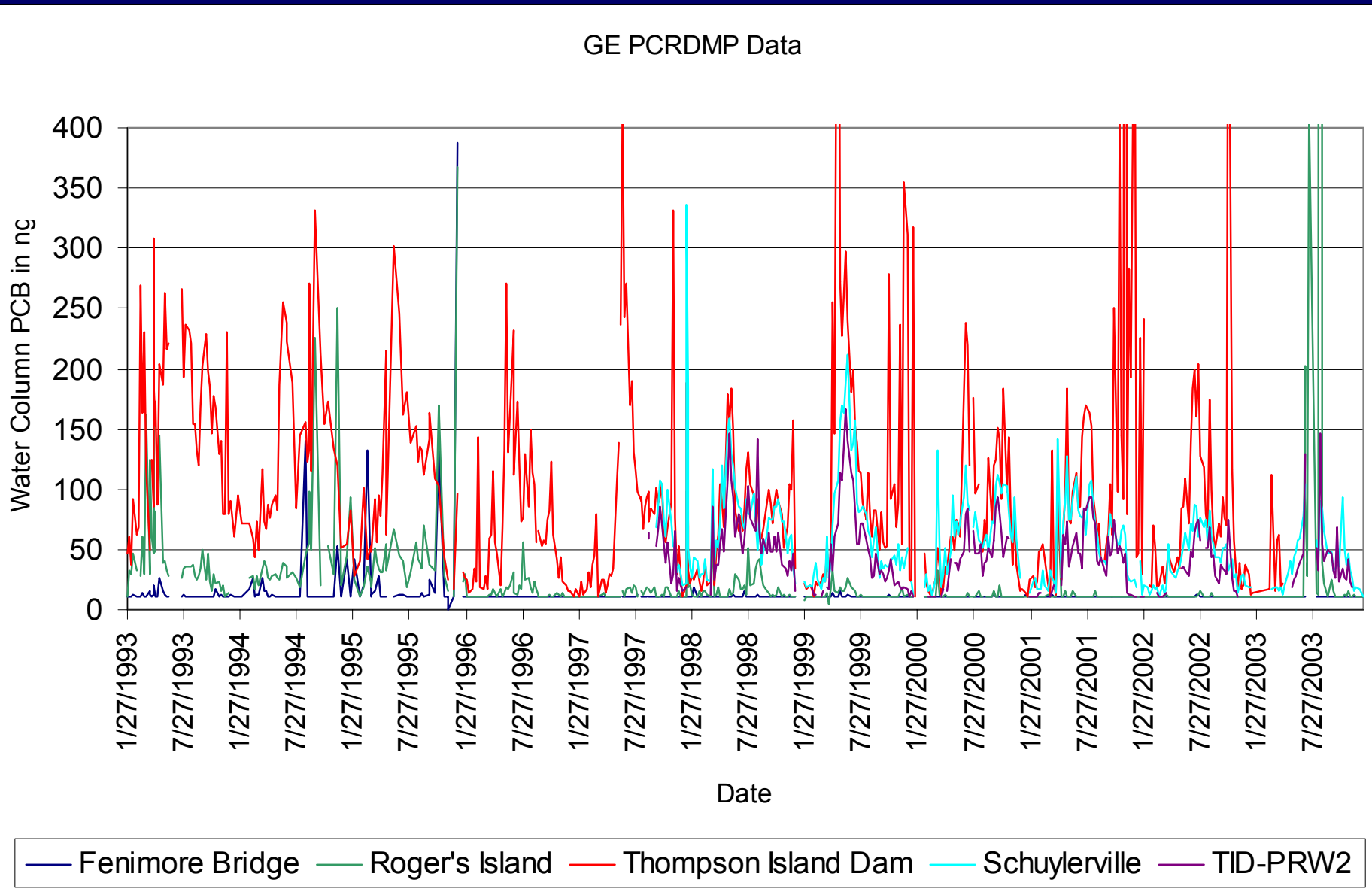
4/5/1998
10/5/1998
4/5/1999
10/5/1999
4/5/2000
10/5/2000
4/5/2001
10/5/2001
4/5/2002
10/5/2002
4/5/2003
10/5/2003
Date
Fenimore Bridge
Roger's Island
Thompson Island Dam
Schuylerville
TID-PRW2


GE PCRDMP Data
Water Column PCB in ng
400
350
300
250
200
150
100
50
0
1/27/1993
7/27/1993
1/27/1994
7/27/1994
1/27/1995
7/27/1995
1/27/1996
7/27/1996
1/27/1997
7/27/1997
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7/27/1999
1/27/2000
7/27/2000
1/27/2001
7/27/2001
1/27/2002
7/27/2002
1/27/2003
7/27/2003
Date
Fenimore Bridge
Roger's Island
Thompson Island Dam
Schuylerville
TID-PRW2