PRPs and Sources of PCBs in the Passaic River Study Area

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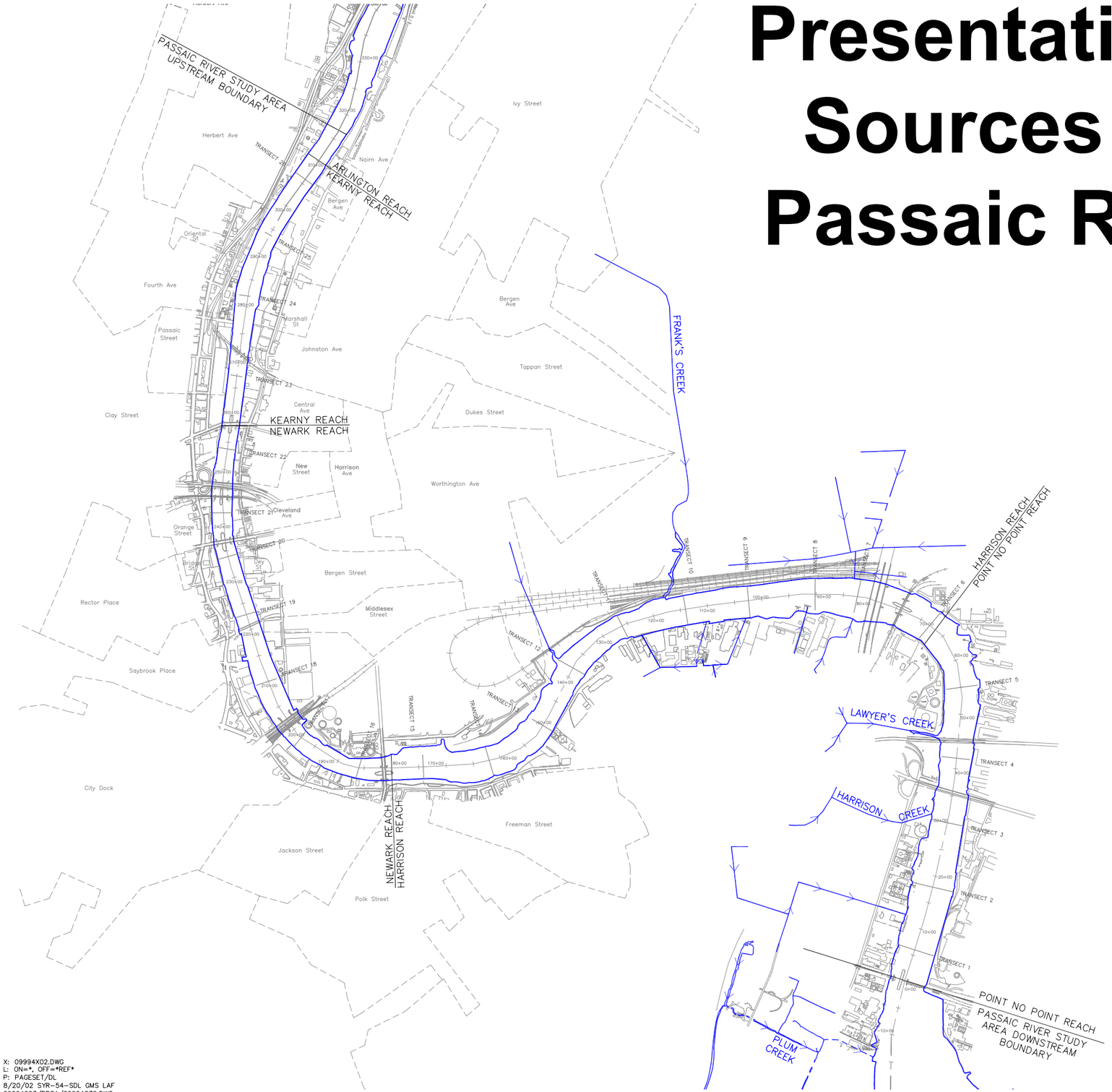
Presentation on PRPs and Sources of PCBs in the Passaic River Study Area



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Facts Regarding PCBs in the PRSA

- PRSA sediments contain elevated concentrations of PCBs.
- Numerous potential sources of PCBs to PRSA sediments have been identified – these “PRPs” include historical users and handlers of PCBs and PCB-contaminated products.
- PCB-contaminated soil and/or groundwater exist(s) at many of these PRPs’ upland locations.
- Many of these PRP locations have historical and/or present day discharge pathways to the PRSA.
- Additional investigation will reveal more PRPs – both within the PRSA as well as the PRRI area.

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Why Focus on PCBs?

- PCB contamination of sediments important from a Risk Assessment standpoint.
- Fishing Ban in-place since mid-1980s in Newark Bay complex, including the PRSA.
- Many sources are present.

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Sources of PCBs to the Environment

- As manufacturing products, such as Aroclors, for uses including:
  - Electrical capacitors and transformers
  - Vacuum pumps
  - Hydraulic fluids
  - Heat transfer systems
  - Adhesives
  - Paints and inks
  - Plasticizers
  - Cutting oils and de-dusting agents
- As contaminants in recycled oil
- Inadvertent generation, from processes such as:
  - Pigment manufacture
  - Dye manufacture

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PCB Investigation Context

- Focus to date only on PRSA – to assist USEPA in identifying PRPs for PCB contamination.
- Presented to USEPA on 18 December 2001.
- Future focus on the PRRI area will yield additional PRPs.
- Evidence more readily available regarding PCB sources than dioxin sources – most sites are typically sampled for PCBs, but not dioxins.

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PCB Investigation Overview: PRP Evidence

- Gathered evidence on approximately 75 PRPs.
- PRPs identified are: users/handlers of PCBs, operators of sites with PCB contamination, or entities using processes known to inadvertently generate PCBs.
- Identified from publicly available records, including:
  - USEPA enforcement and compliance records
  - NJDEP site remediation records and files
  - local city records
  - product sales records
  - PRP responses to CERCLA 104(e) requests.

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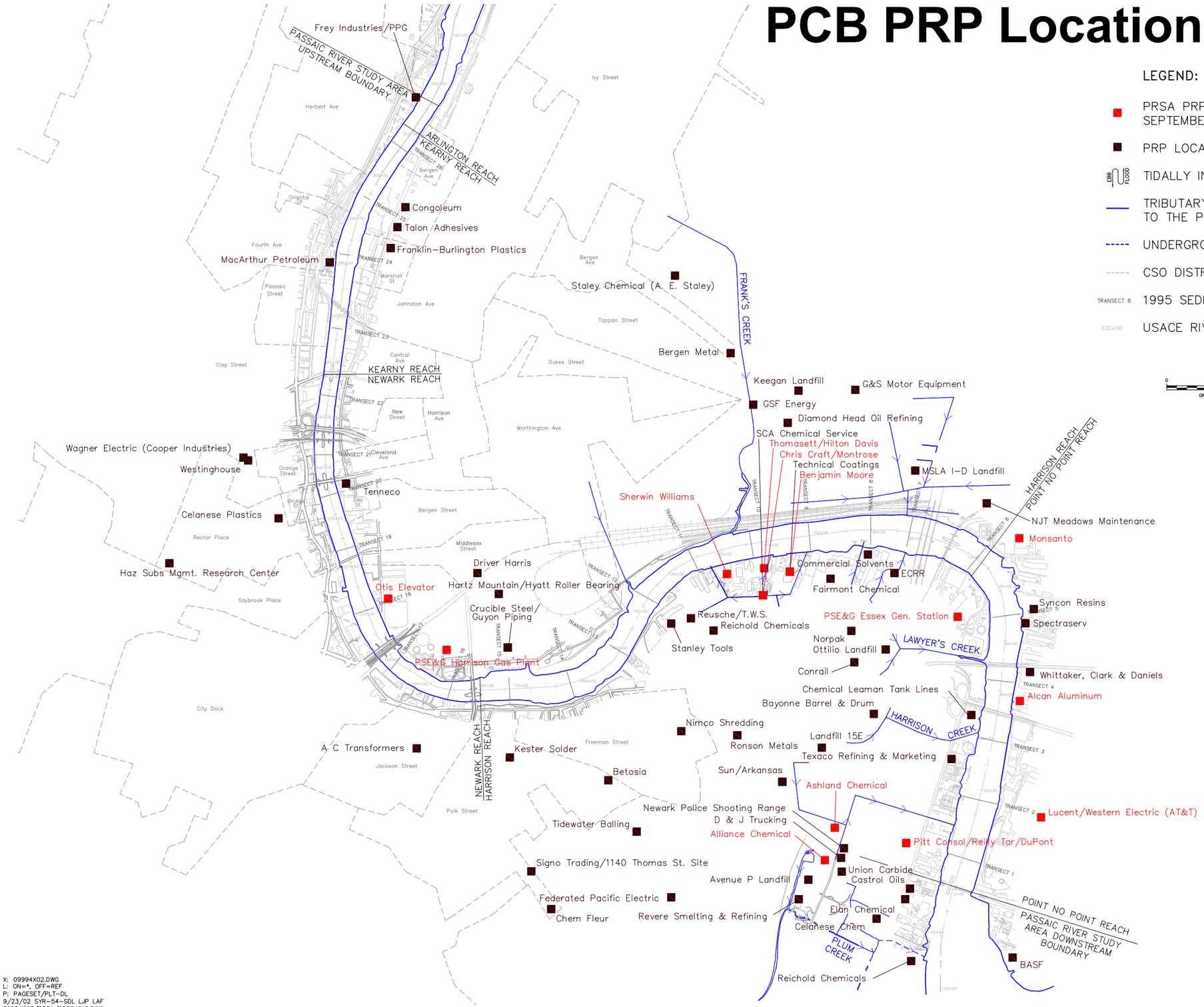
PCB PRP Locations in the PRSA



PRP:
A.C. Transformers
Alcan Aluminum
Alliance Chemical
Ashland Chemical
Avenue P Landfill
BASF
Bayonne Barrel & Drum
Benjamin Moore
Bergen Metal
Betosia
Celanese Chem
Celanese Plastics
Chem Fleur
Chemical Leaman Tank Lines
Chris Craft/Montrose
Commercial Solvents
Congoleum
Conrail
Crucible Steel/Guyon Piping
D & J Trucking
Diamond Head Oil Refining
Driver Harris
ECRR
Elan Chemical
Fairmont Chemical
Federated Pacific Electric
Franklin–Burlington Plastics
Frey Industries/PPG
G&S Motor Equipment
GSF Energy
Hartz Mountain/Hyatt Roller Bearing
Haz Subs Mgmt. Research Center
Keegan Landfill
Kester Solder
Landfill 15E
Lucent/Western Electric (AT&T)
MacArthur Petroleum
Monsanto
MSLA I–D Landfill
Newark Police Shooting Range
Nimco Shredding
NJT Meadows Maintenance
Norpak
Otis Elevator
Ottilio Landfill
Pitt Consol/Reilly Tar/DuPont
PSE&G Essex Gen. Station
PSE&G Harrison Gas Plant
Reichold Chemicals
Reusche/T.W.S.
Revere Smelting & Refining
Ronson Metals
SCA Chemical Service
Sherwin Williams
Signo Trading/1140 Thomas St. Site
Spectraserv
Staley Chemical (A. E. Staley)
Stanley Tools
Sun/Arkansas
Syncon Resins
Talon Adhesives
Technical Coatings
Tenneco
Texaco Refining & Marketing
Thomasett/Hilton Davis
Tidewater Balling
Union Carbide Castrol Oils
Wagner Electric (Cooper Industries)
Westinghouse
Whittaker, Clark & Daniels

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PCB Investigation Overview: PRP Evidence

- Evaluated evidence for each PRP location to identify historical or present day discharge pathways to the PRSA.
- Compared evidence for each PRP location to the PRSA sediment chemistry near the site's discharge pathway(s).

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PCB Investigation Overview: Sediment Chemistry

- PRSA sediment chemistry was reviewed to identify areas of peak concentrations of PCBs.
- Both Aroclors and dioxin-like congeners were utilized:
  - Aroclors historically utilized in sampling of upland sources.
  - Dioxin-like congeners are utilized to assess risk in sediments.

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PCB Investigation Overview: Sediment Chemistry

- PCB Aroclors considered are:

1221	1248	1260
1242	1254	

- Dioxin-like PCB congeners considered are:

BZ77	BZ118	BZ157	BZ189
BZ105	BZ126	BZ167	
BZ114	BZ156	BZ169	

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PCB Investigation Overview: Sediment Chemistry

- Grouped sediment data for each Aroclor and congener by:
  - Highest individual measurement
  - Top 5% of detected concentrations
  - Top 25% of detected concentrations
- Each sampling location is a “core” – typically representing 3 to 6 individual sampling depth ranges.
- The sample locations were evaluated as to their proximity to PCB sources, and the sample depth ranges were evaluated to help approximate the period of PCB discharge.

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PCB Aroclor and Congener Source Areas in the PRSA

LEGEND:

- TIDALLY INFLUENCED FLOW (EBB / FLOOD)
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- × 208 RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 1995 SEDIMENT SAMPLING TRANSECT
- 230+00 USACE RIVER STATIONING

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Sediment Chemistry Observations

- There is ubiquitous PCB contamination of PRSA sediments.
- Despite the wide-spread nature of this contamination, PRPs can be identified.
- Further investigation will yield additional PRPs.

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Reach-by-Reach Presentation

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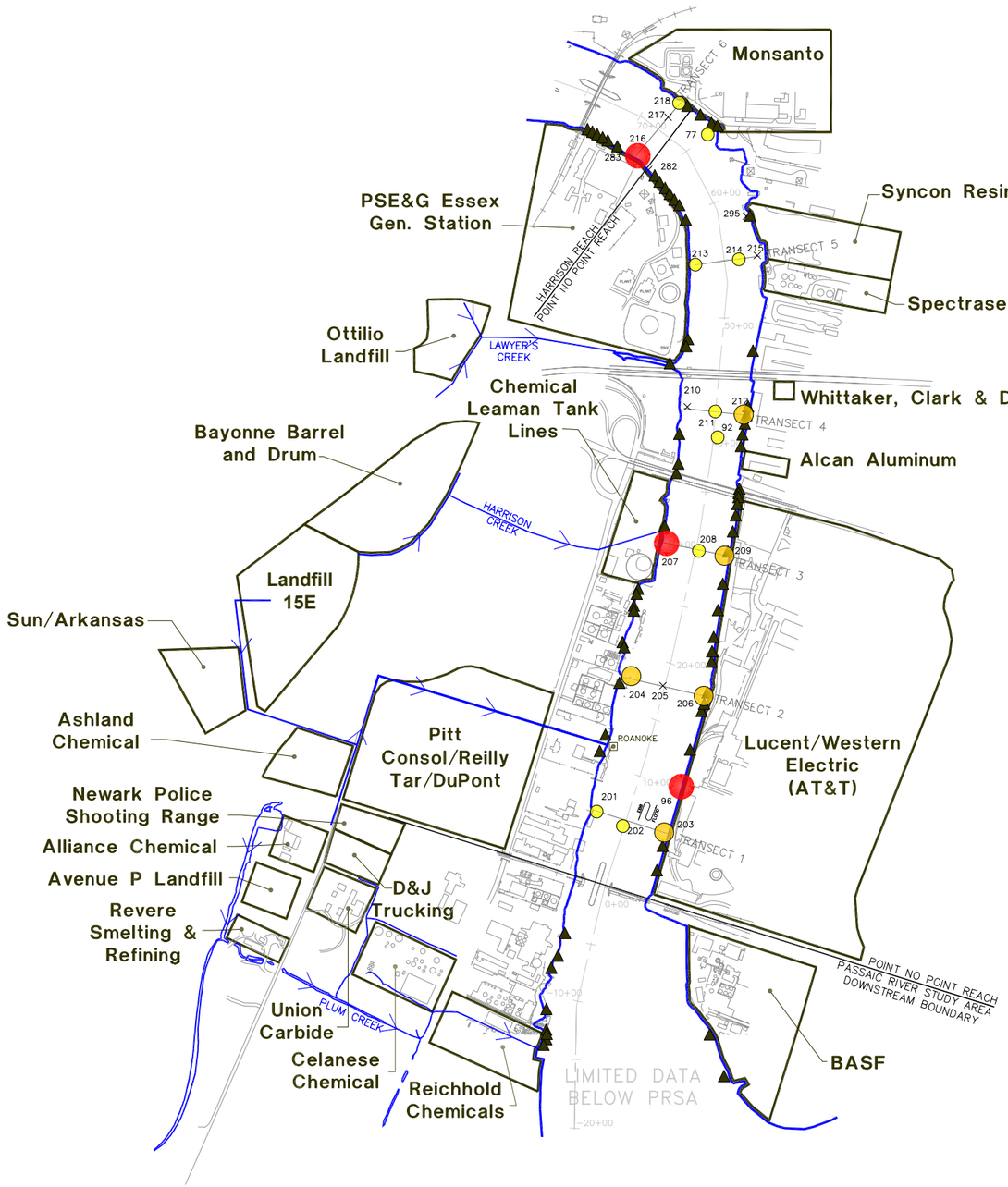
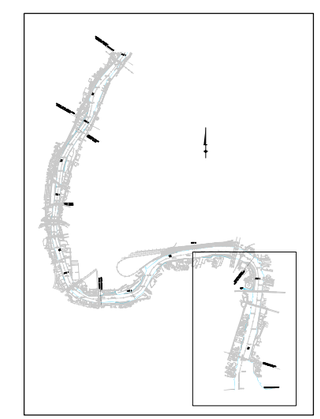
PCB PRP Locations and PCB Source Areas in Point No Point Reach of the PRSA



LEGEND:

- TIDALLY INFLUENCED FLOW (EBB / FLOOD)
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 × RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 — 1995 RI SEDIMENT SAMPLING TRANSECT
- 230+00 — USACE RIVER STATIONING



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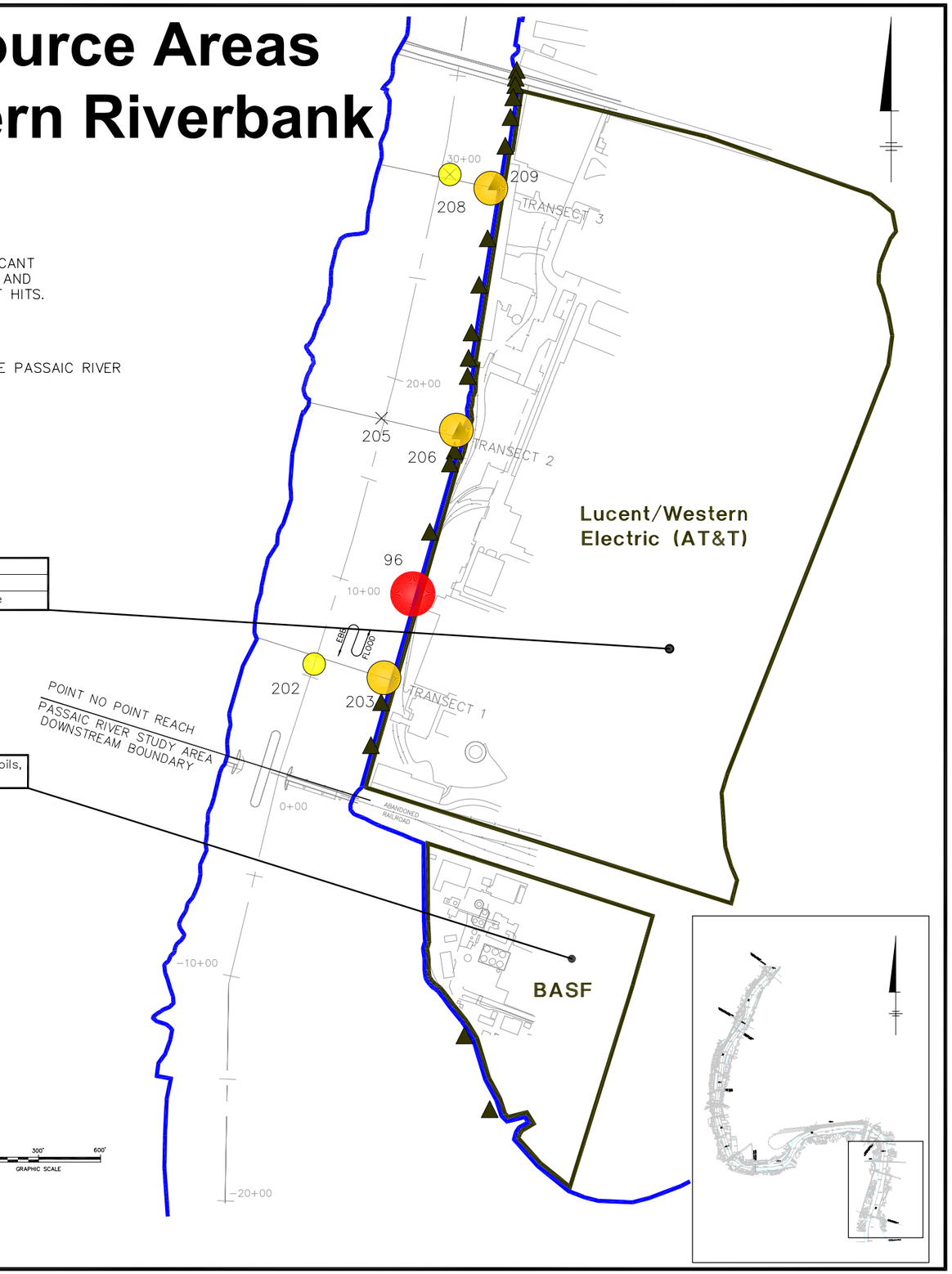
PCB PRP Locations and PCB Source Areas Along Point No Point Reach Eastern Riverbank

LEGEND:

- TIDALLY INFLUENCED FLOW (EBB / FLOOD)
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 — RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 — 1995 SEDIMENT SAMPLING TRANSECT
- 230+00 — USACE RIVER STATIONING



89,000 ppm total PCBs in site soils
3,800 ppm Aroclor 1260 in site soils
PCB transformers and PCB fluid storage on site

Aroclors 1016, 1221, 1242, 1248, 1254, and 1260 in soils, groundwater, and wastewater lagoon.

Core 96

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
96A017	1248	3280	BZ77	33
			BZ105	65
			BZ126	1.3
96A047	1260	765	BZ77	42
			BZ105	72
			BZ118	260
			BZ126	1.2
			BZ169	0.13
96A077	1260	8730	BZ105	75

Core 202

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20205E			BZ105	60
			BZ118	170
			BZ157	5
20206E			BZ77	30
			BZ105	67
			BZ118	220
			BZ156	22
			BZ157	6.4

Core 203

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20308A	1248	2850	BZ77	83
			BZ105	160
			BZ114	15
			BZ118	430
			BZ126	1.3
			BZ156	47
			BZ157	13
			BZ167	34
			BZ169	0.059
20310A	1248	3250	BZ77	43
	1254	1670	BZ105	180
			BZ114	11
			BZ118	450
			BZ118	216
			BZ126	1.1
			BZ156	42
			BZ157	11
			BZ167	28
			BZ169	0.058

Core 206

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20602A			BZ105	75
			BZ118	190
			BZ156	21
			BZ157	4.5
			BZ189	1.8
20603A	1248	2250	BZ77	29
	1260	1080	BZ105	78
			BZ114	7.1
			BZ118	210
			BZ126	0.96
			BZ156	25
			BZ157	5.7
			BZ167	28
			BZ189	2.6
20604A	1248	4490	BZ77	73
	1254	2370	BZ105	130
			BZ114	14
			BZ118	330
			BZ118	256
			BZ126	1.2
			BZ156	35
			BZ157	6.4
			BZ167	40
			BZ189	2.9
20605A	1248	4720	BZ77	98
	1254	2970	BZ105	190
			BZ114	19
			BZ118	440
			BZ118	361
			BZ126	1.5
			BZ156	49
			BZ157	8.9
			BZ167	53
			BZ189	3.7
20606A			BZ167	29

Core 208

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20802A	1248	2570	BZ77	62
			BZ105	98
			BZ114	8.8
			BZ118	250
			BZ156	23
			BZ157	5.7
			BZ169	0.063

Core 209

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20902B	1248	3270	BZ105	86
			BZ114	7.7
			BZ118	220
			BZ156	24
			BZ157	6.2
20903B			BZ77	35
			BZ105	64
			BZ118	220
			BZ156	22
			BZ157	6.8
			BZ169	0.069
20904B	1248	2500	BZ77	67
			BZ105	130
			BZ114	12
			BZ118	360
			BZ126	1.1
			BZ156	31
			BZ157	7.9
20905B	1248	4320	BZ77	91
	1254	2530	BZ105	240
			BZ114	21
			BZ118	293
			BZ118	630
			BZ126	1.5
			BZ156	54
			BZ157	13
			BZ167	48
20906B			BZ167	73

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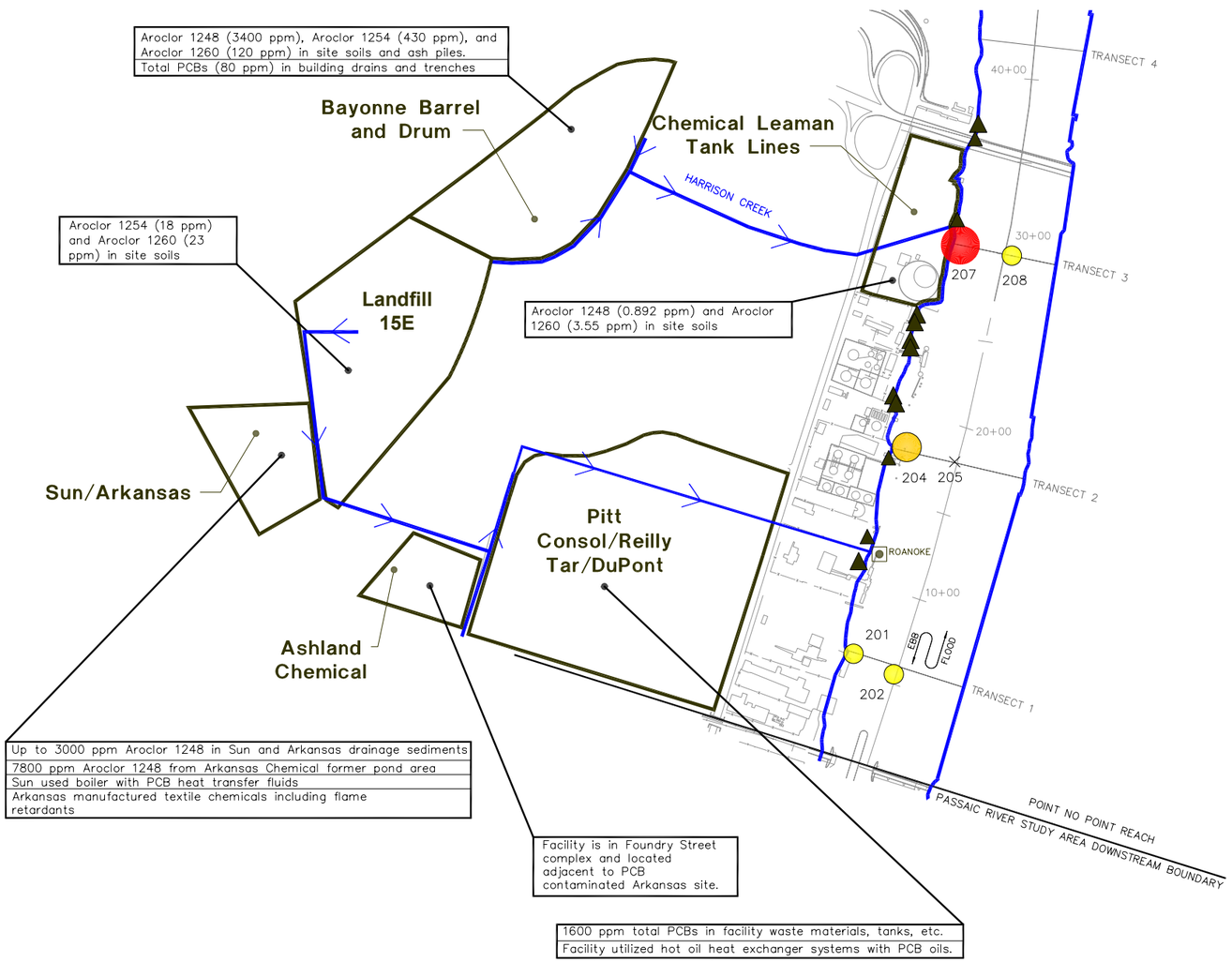
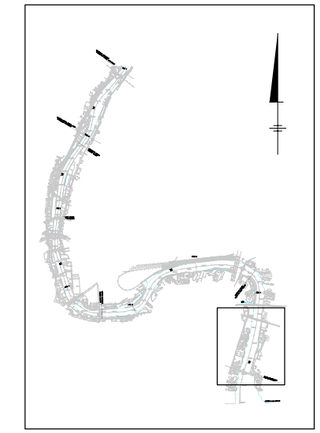
PCB PRP Locations and PCB Source Areas Along Point No Point Reach Western Riverbank



LEGEND:

- TIDALLY INFLUENCED FLOW
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 1995 RI SEDIMENT SAMPLING TRANSECT
- 230+00 USACE RIVER STATIONING



Core 201

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20101A			BZ169	0.078
20106A	1248	3150	BZ105	91
			BZ118	230

Core 202

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20205E			BZ105	60
			BZ118	170
			BZ157	5
20206E			BZ77	30
			BZ105	67
			BZ118	220
			BZ156	22
			BZ157	6.4

Core 204

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20405A	1248	4910	BZ77	68
	1254	2040	BZ105	100
			BZ114	9.9
			BZ118	205
			BZ118	240
			BZ156	24
			BZ157	4.7
			BZ167	30
			BZ189	1.7
20406A	1248	21900	BZ77	360
	1254	7070	BZ105	530
			BZ114	58
			BZ118	1100
			BZ118	685
			BZ126	3.9
			BZ156	110
			BZ157	22
			BZ167	91
			BZ189	5.7

Core 207

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20702A	1260	2110	BZ77	37
			BZ105	130
			BZ114	10
			BZ118	400
			BZ126	1.5
			BZ156	56
			BZ157	13
			BZ167	36
			BZ169	0.097
			BZ189	3.5
20703A	1248	5100	BZ77	100
	1254	5630	BZ105	450
			BZ114	53
			BZ118	682
			BZ118	1600
			BZ126	3.3
			BZ156	90
			BZ157	25
			BZ167	68
			BZ169	0.086
			BZ189	6.1
20704A	1248	5310	BZ77	32
	1254	18100	BZ105	780
			BZ114	69
			BZ118	2480
			BZ118	2200
			BZ126	4.2
			BZ156	180
			BZ157	47
			BZ167	190
			BZ169	0.079
			BZ189	8.3

Core 208

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
20802A	1248	2570	BZ77	62
			BZ105	98
			BZ114	8.8
			BZ118	250
			BZ156	23
			BZ157	5.7
			BZ169	0.063

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GRAPHIC SCALE

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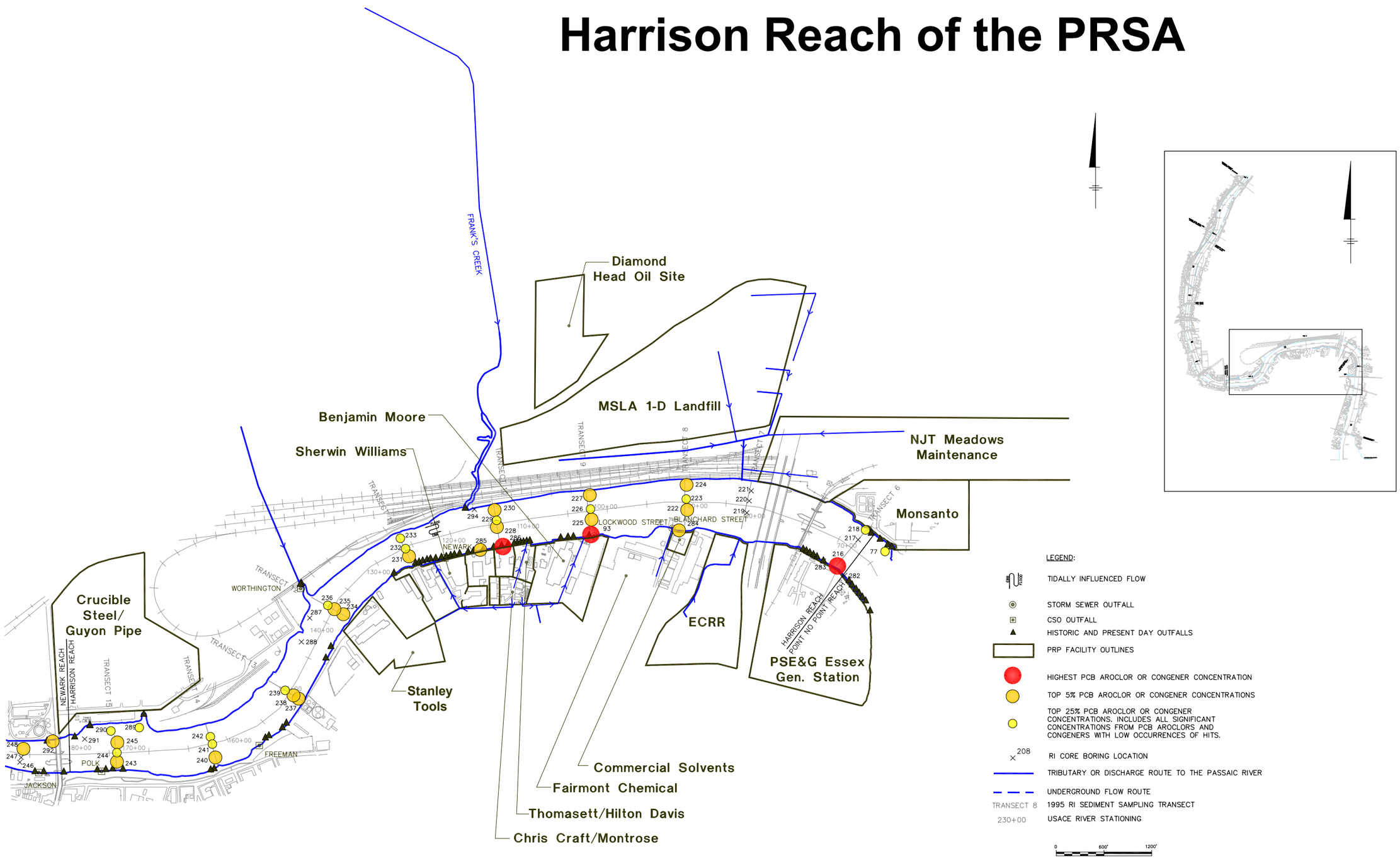
PCB PRP Locations and PCB Source Areas in Harrison Reach of the PRSA



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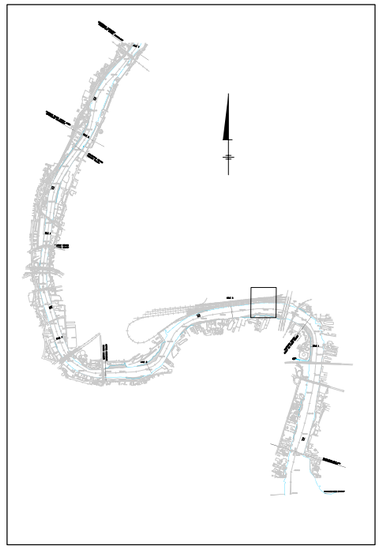
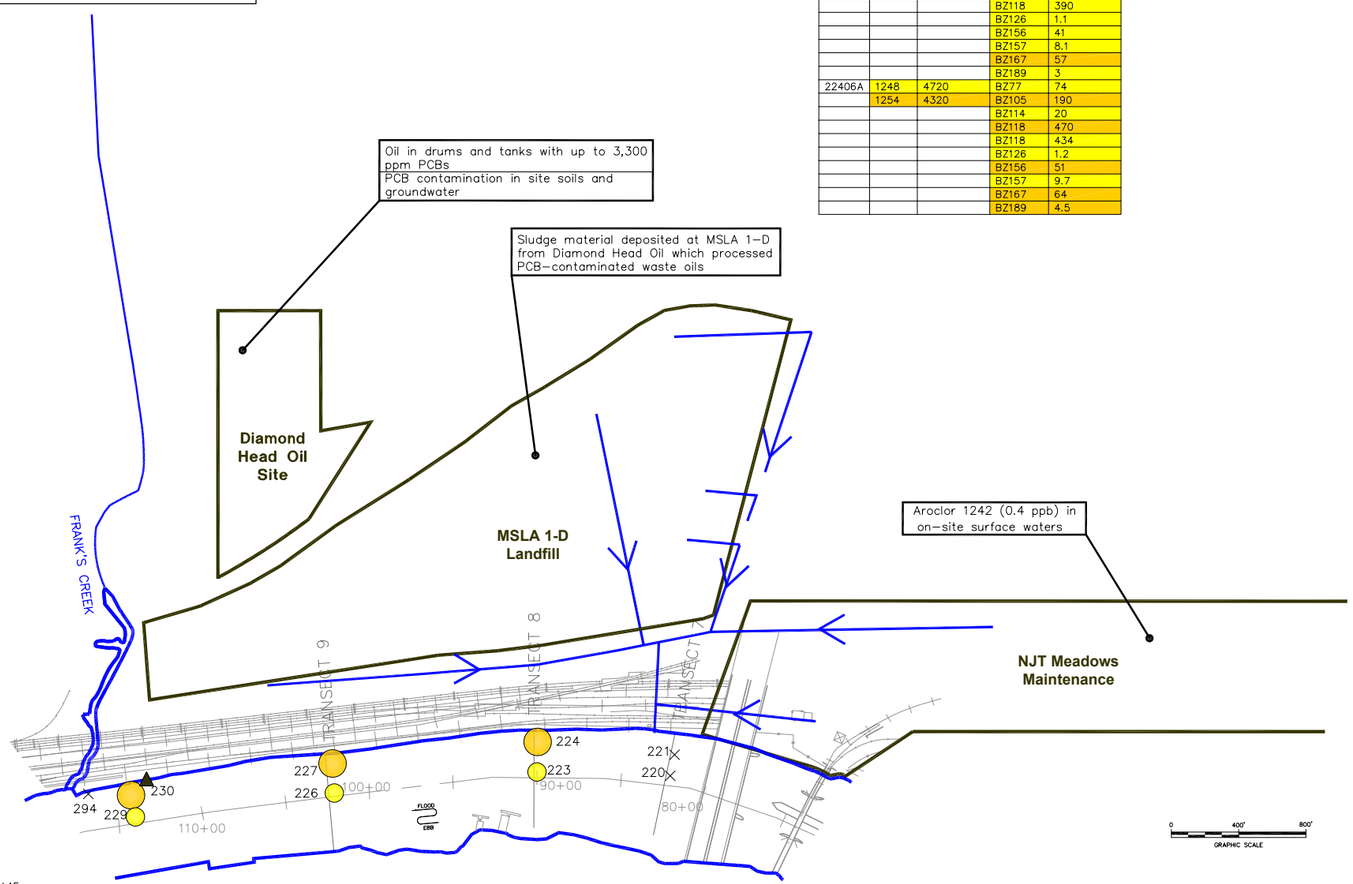
PCB PRP Locations and PCB Source Areas Along Harrison Reach Northeastern Riverbank





Core 223				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22304A	1248	4370	BZ77	32
	1254	2480	BZ105	100
			BZ114	11
			BZ118	199
			BZ118	270
			BZ126	0.84
			BZ156	34
			BZ157	6.2
			BZ167	43
22305A	1254	2380	BZ105	96
			BZ114	9.5
			BZ118	240
			BZ156	31
			BZ157	6
			BZ167	37
22306A	1248	3420	BZ77	37
	1254	2420	BZ105	110
			BZ114	11
			BZ118	208
			BZ118	290
			BZ126	0.97
			BZ156	39
			BZ157	9.1
			BZ167	52

Core 224				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22402A	1248	2860	BZ77	61
			BZ105	77
			BZ114	7.5
			BZ118	337
			BZ118	220
			BZ126	0.85
			BZ167	29
			BZ189	1.8
22403A	1248	5430	BZ77	88
	1254	3250	BZ105	150
			BZ114	17
			BZ118	380
			BZ118	385
			BZ126	1.4
			BZ156	35
			BZ157	7
			BZ167	52
			BZ189	3.1
22404A	1248	5430	BZ77	92
	1254	4740	BZ105	170
			BZ114	16
			BZ118	324
			BZ118	400
			BZ126	1.3
			BZ156	41
			BZ157	8.2
			BZ167	53
			BZ189	3
22405A			BZ77	120
			BZ105	180
			BZ114	16
			BZ118	390
			BZ126	1.1
			BZ156	41
			BZ157	8.1
			BZ167	57
			BZ189	3
22406A	1248	4720	BZ77	74
	1254	4320	BZ105	190
			BZ114	20
			BZ118	470
			BZ118	434
			BZ126	1.2
			BZ156	51
			BZ157	9.7
			BZ167	64
			BZ189	4.5

Core 226				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22603A	1254	2180	BZ77	50
			BZ105	83
			BZ114	8.4
			BZ118	220
			BZ126	0.94
			BZ156	23
			BZ157	4.6
			BZ167	33
			BZ189	2.4
22604A	1248	3340	BZ77	63
	1254	2990	BZ105	130
			BZ114	12
			BZ118	340
			BZ118	291
			BZ126	1
			BZ156	33
			BZ157	6.6
			BZ167	43
			BZ189	2.9
22605A	1248	2960	BZ77	46
	1254	3320	BZ105	120
			BZ114	12
			BZ118	320
			BZ126	0.86
			BZ156	34
			BZ157	7
			BZ167	37
			BZ189	2.9

Core 227				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22701A			BZ77	34
			BZ105	72
			BZ118	190
			BZ156	20
22702A	1248	2280	BZ77	61
	1254	1660	BZ105	110
			BZ114	12
			BZ118	330
			BZ126	1.1
			BZ156	30
			BZ157	6.3
			BZ167	44
22703A	1248	3780	BZ77	68
	1254	2960	BZ105	150
			BZ114	15
			BZ118	350
			BZ126	1.2
			BZ156	38
			BZ157	7.4
			BZ167	56
			BZ189	1.7
22704A	1248	5690	BZ77	100
	1254	4730	BZ105	220
			BZ114	21
			BZ118	510
			BZ118	344
			BZ126	1.7
			BZ156	57
			BZ157	12
			BZ167	62
			BZ189	2.3
22705A	1248	3800	BZ77	92
	1254	2550	BZ105	250
			BZ114	26
			BZ118	600
			BZ126	1.6
			BZ156	69
			BZ157	15
			BZ167	70
			BZ189	2.9
22706A	1254	2660	BZ77	42
			BZ105	120
			BZ114	11
			BZ118	330
			BZ126	0.86
			BZ156	38
			BZ157	7.9
			BZ167	46
			BZ189	2.3

Core 229				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22904A			BZ105	84
			BZ114	8.3
			BZ118	230
			BZ126	0.95
			BZ157	4.5
			BZ167	36
			BZ189	1.9
22905A	1248	2370	BZ77	59
			BZ105	120
			BZ114	12
			BZ118	330
			BZ156	31
			BZ157	6.2
			BZ167	47
			BZ189	2.4
22906A	1248	2500	BZ77	85
			BZ105	180
			BZ114	16
			BZ118	440
			BZ126	1.4
			BZ156	45
			BZ157	9
			BZ167	49
			BZ189	3.3

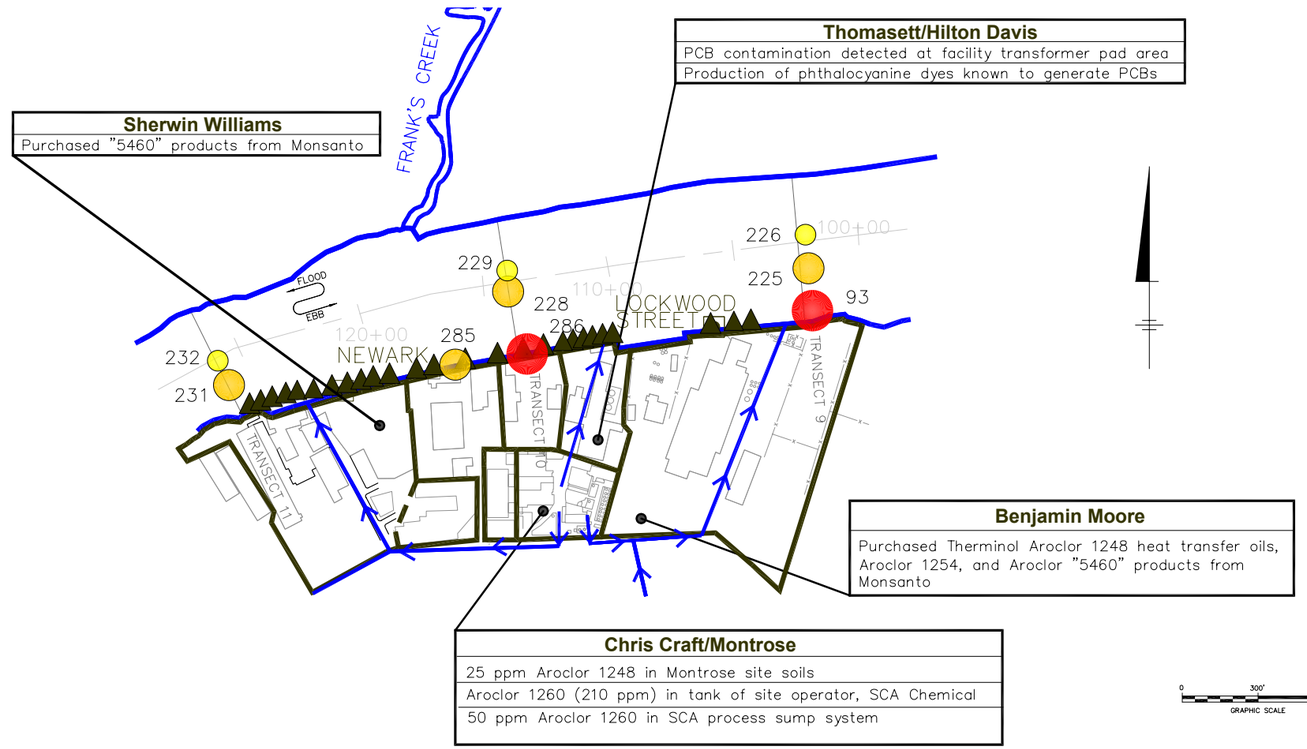
Core 230				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
23004A	1248	2520	BZ77	40
			BZ105	88
			BZ114	9.2
			BZ118	210
			BZ156	23
			BZ167	33
23005A	1254	2040	BZ77	67
			BZ105	100
			BZ114	11
			BZ118	250
			BZ126	1.1
			BZ156	27
			BZ157	4.9
			BZ167	38
23006A	1248	3350	BZ77	85
	1254	2670	BZ105	170
			BZ114	17
			BZ118	400
			BZ118	266
			BZ126	1.3
			BZ156	46
			BZ157	9.6
			BZ167	55
			BZ189	2.4
23007A			BZ105	79
			BZ114	7.2
			BZ118	481
			BZ118	210
			BZ156	24
			BZ157	4.7
			BZ167	31

LEGEND:

- TIDALLY INFLUENCED FLOW
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 1995 RI SEDIMENT SAMPLING TRANSECT
- 230+00 USACE RIVER STATIONING

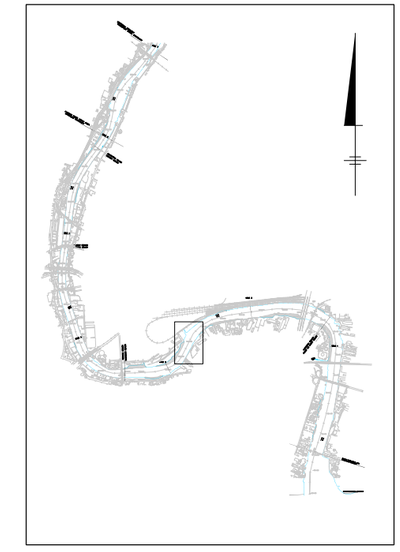
X: 09994XR2, 09994X13
L: ON=*, OFF=*REF*
P: PAGESET/DL
8/20/02 SYR-54-SDL GMS LAF
09994063/PRSA/09994G32.DWG

PCB PRP Locations and PCB Source Areas Along Harrison Reach Southwestern Riverbank



LEGEND:

- TIDALLY INFLUENCED FLOW (EBB / FLOOD)
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 — RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 — 1995 SEDIMENT SAMPLING TRANSECT
- 230+00 — USACE RIVER STATIONING



Core 93

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
93A001			BZ169	0.078
93A024	1248	47700	BZ77	320
			BZ105	170
			BZ118	220
			BZ126	5
			BZ169	0.33
93A040			BZ77	33
			BZ126	1.8

Core 225

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22503A			BZ77	37
			BZ105	76
			BZ114	7.9
			BZ118	220
			BZ156	24
			BZ157	4.7
			BZ167	36
22504A	1254	1710	BZ77	73
			BZ105	160
			BZ114	17
			BZ118	410
			BZ126	1.3
			BZ156	41
			BZ157	7.8
			BZ167	46
			BZ189	2.1
22505A	1248	2880	BZ77	57
			BZ105	130
			BZ114	13
			BZ118	811
			BZ118	330
			BZ126	1
			BZ156	36
			BZ157	7.1
			BZ167	43
			BZ189	1.9
22506A			BZ118	734

Core 226

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22603A	1254	2180	BZ77	50
			BZ105	83
			BZ114	8.4
			BZ118	220
			BZ126	0.94
			BZ156	23
			BZ157	4.6
			BZ167	33
			BZ189	2.4
22604A	1248	3340	BZ77	63
	1254	2990	BZ105	130
			BZ114	12
			BZ118	340
			BZ118	291
			BZ126	1
			BZ156	33
			BZ157	6.6
			BZ167	43
			BZ189	2.9
22605A	1248	2960	BZ77	46
	1254	3320	BZ105	120
			BZ114	12
			BZ118	320
			BZ126	0.86
			BZ156	34
			BZ157	7
			BZ167	37
			BZ189	2.9

Core 228

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22803B			BZ77	94
			BZ105	100
			BZ114	11
			BZ118	290
			BZ126	1.1
			BZ156	29
			BZ157	6.7
			BZ189	1.7
22804B	1254	1730	BZ77	47
			BZ105	100
			BZ114	10
			BZ118	270
			BZ156	27
			BZ157	5.9
			BZ189	1.7
22805B	1254	1780		

Core 229

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
22904A			BZ77	40
			BZ105	84
			BZ114	8.3
			BZ118	230
			BZ126	0.95
			BZ157	4.5
			BZ167	36
			BZ189	1.9
22905A	1248	2370	BZ77	59
			BZ105	120
			BZ114	12
			BZ118	330
			BZ156	31
			BZ157	6.2
			BZ167	47
			BZ189	2.4
22906A	1248	2500	BZ77	85
			BZ105	180
			BZ114	16
			BZ118	440
			BZ126	1.4
			BZ156	45
			BZ157	9
			BZ167	49
			BZ189	3.3

Core 231

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
23103A	1248	4260	BZ77	63
	1254	3110	BZ105	140
			BZ114	14
			BZ118	360
			BZ118	249
			BZ126	1.7
			BZ156	39
			BZ157	9.2
			BZ167	36
			BZ189	1.9
23104A	1248	2410	BZ77	79
			BZ105	190
			BZ114	20
			BZ118	480
			BZ126	1.8
			BZ156	51
			BZ157	12
			BZ167	54
			BZ189	2.4
23105A			BZ77	40
			BZ105	150
			BZ114	15
			BZ118	390
			BZ126	1.1
			BZ156	45
			BZ157	11
			BZ167	43
23106A			BZ118	457

Core 232

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
23204A			BZ105	65
			BZ118	180
			BZ156	24
			BZ157	5.3
			BZ167	31

Core 285

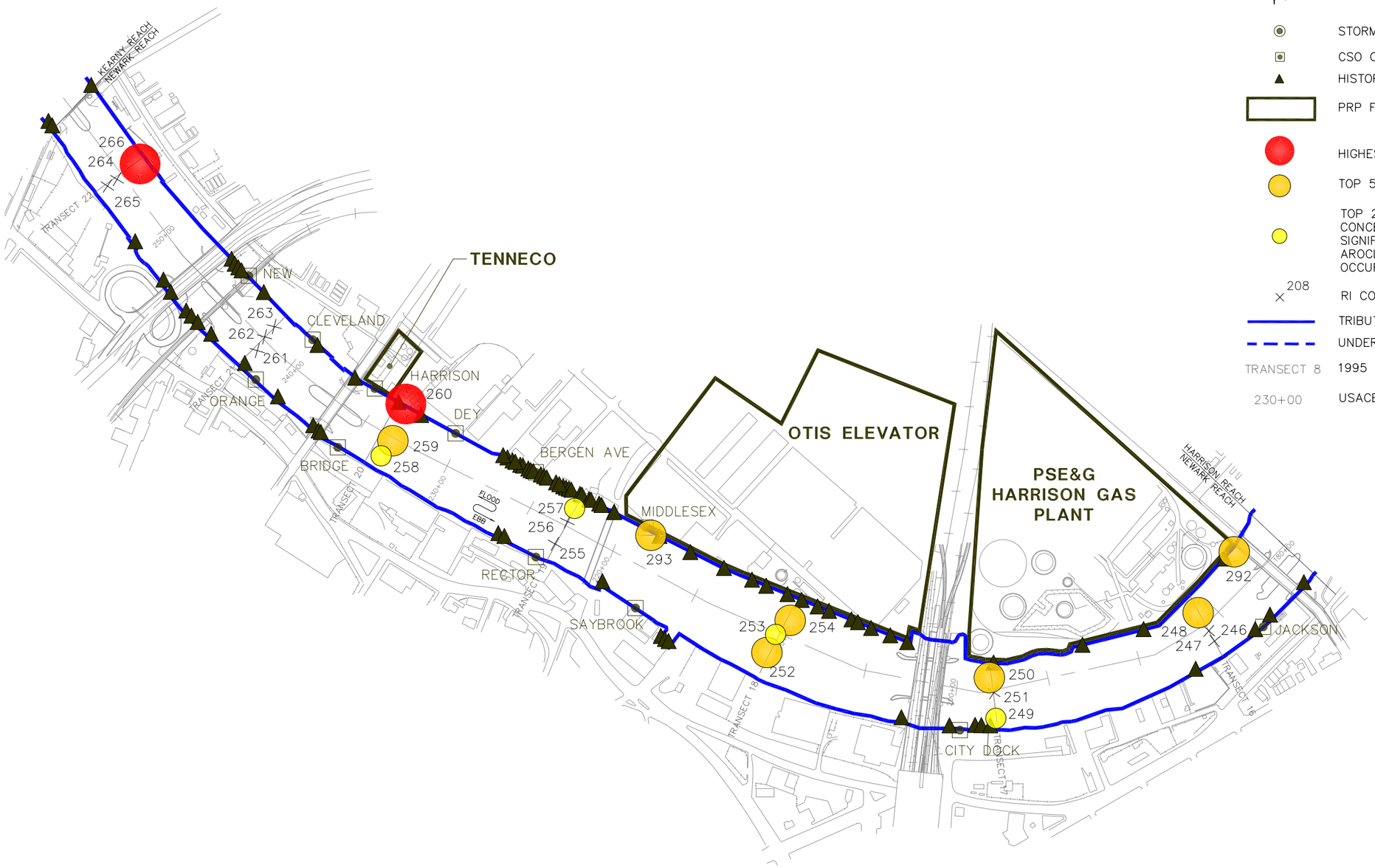
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
28502A			BZ77	29
			BZ118	310
28503A	1242	5580	BZ77	45
			BZ105	150
			BZ114	13
			BZ118	410
			BZ118	1790
			BZ126	2.6
			BZ156	42
			BZ157	11
			BZ167	42
			BZ189	2.8
28504A	1248	3670	BZ77	50
			BZ105	66
			BZ118	469
			BZ118	230
			BZ126	1.2
			BZ156	21
			BZ157	4.8
			BZ167	28
			BZ189	2.6
28505A	1248	3540	BZ77	100
			BZ105	130
			BZ114	13
			BZ118	370
			BZ126	1.2
			BZ156	28
			BZ157	6.2
			BZ167	36
			BZ189	2.6
28506A			BZ77	200
			BZ105	340
			BZ114	19
			BZ118	530
			BZ126	4.8

Core 286

Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
28603B	1248	3640	BZ77	42
			BZ105	120
			BZ114	10
			BZ118	340
			BZ126	1.2
			BZ156	34
			BZ157	8.9
			BZ167	34
			BZ189	2.6
28604B	1248	3920	BZ77	84
	1254	3110	BZ105	110
			BZ114	9.7
			BZ118	330
			BZ126	1.2
			BZ156	24
			BZ157	5.3
			BZ167	34
			BZ189	2.4
28605B	1248	15700	BZ77	260
			BZ105	450
			BZ114	41
			BZ118	1100
			BZ126	3.2
			BZ156	36
			BZ157	8.5
			BZ167	34
			BZ189	5.9
28606B			BZ77	58
			BZ105	130
			BZ114	13
			BZ118	360
			BZ126	5.5
			BZ156	47
			BZ157	5.5
			BZ167	120
			BZ169	0.49
			BZ189	13

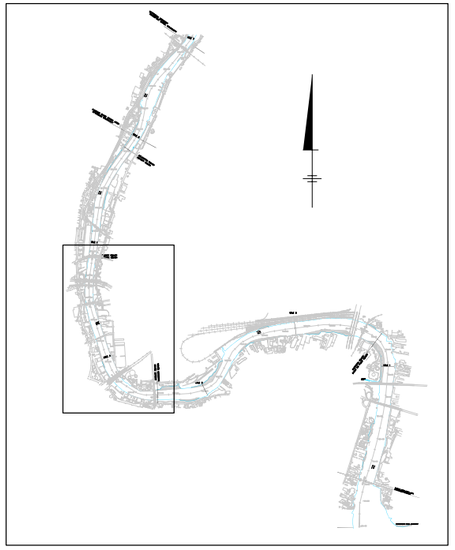
X: 09994XL2, 09994X13
L: ON=*, OFF=*REF*
P: PAGESET/DL
8/20/02 SYR-54-SDL GMS LAF
09994063/PRSA/09994G33.DWG

PCB PRP Locations and PCB Source Areas in Newark Reach of the PRSA



LEGEND:

- TIDALLY INFLUENCED FLOW
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 × RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 — 1995 RI SEDIMENT SAMPLING TRANSECT
- 230+00 — USACE RIVER STATIONING



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P: PAGESET/DL
8/20/02 SYR-54-SDL GMS LAF
09994063/PRSA/09994G27.DWG

PCB PRP Locations and PCB Source Areas Along Newark Reach Eastern Riverbank

Core 248				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
24803A	1248	3750	BZ77	91
	1254	3440	BZ105	170
			BZ114	17
			BZ118	430
			BZ118	296
			BZ126	1.5
			BZ156	47
			BZ157	10
			BZ167	44
			BZ189	2.4
24804A			BZ77	34
			BZ105	70
			BZ118	180

Core 251				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
25101B			BZ189	4.2
25103B	1248	2250	BZ77	37
			BZ105	86
			BZ114	8.9
			BZ118	240
			BZ156	26
			BZ157	5.2
			BZ167	32
			BZ189	3.3
25104B	1248	5390	BZ77	64
	1254	2990	BZ105	170
			BZ114	17
			BZ118	283
			BZ118	400
			BZ126	0.94
			BZ156	41
			BZ157	9.2
			BZ167	37
			BZ189	3.1
25105B	1248	4110	BZ77	48
	1254	2240	BZ105	130
			BZ114	14
			BZ118	320
			BZ118	215
			BZ126	1
			BZ156	32
			BZ157	6.8
			BZ167	30
			BZ189	2.7

Core 253				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
25304A	1260	827	BZ77	30
			BZ105	65
			BZ118	160

Core 254				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
25401A	1260	685	BZ156	41
			BZ167	48
			BZ189	12
25405A			BZ77	39
			BZ105	100
			BZ114	10
			BZ118	260
			BZ156	26
			BZ157	5.5
			BZ167	28
			BZ189	2

Core 292				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
29202C	1248	2500	BZ105	61
29204C			BZ118	180
29205C	1248	2770	BZ77	63
	1254	2210	BZ105	99
			BZ114	8.7
			BZ118	290
			BZ126	0.99
			BZ156	27
			BZ157	7.2
29206C	1248	18400	BZ77	81
	1254	15800	BZ105	130
			BZ114	11
			BZ118	360
			BZ126	1.1
			BZ156	33
			BZ157	8
			BZ167	28
			BZ189	1.7

Core 293				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
29301A			BZ156	72
			BZ167	36

LEGEND:

EBB FLOOD — TIDALLY INFLUENCED FLOW

STORM SEWER OUTFALL

CSO OUTFALL

HISTORIC AND PRESENT DAY OUTFALLS

PRP FACILITY OUTLINES

HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION

TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS

TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.

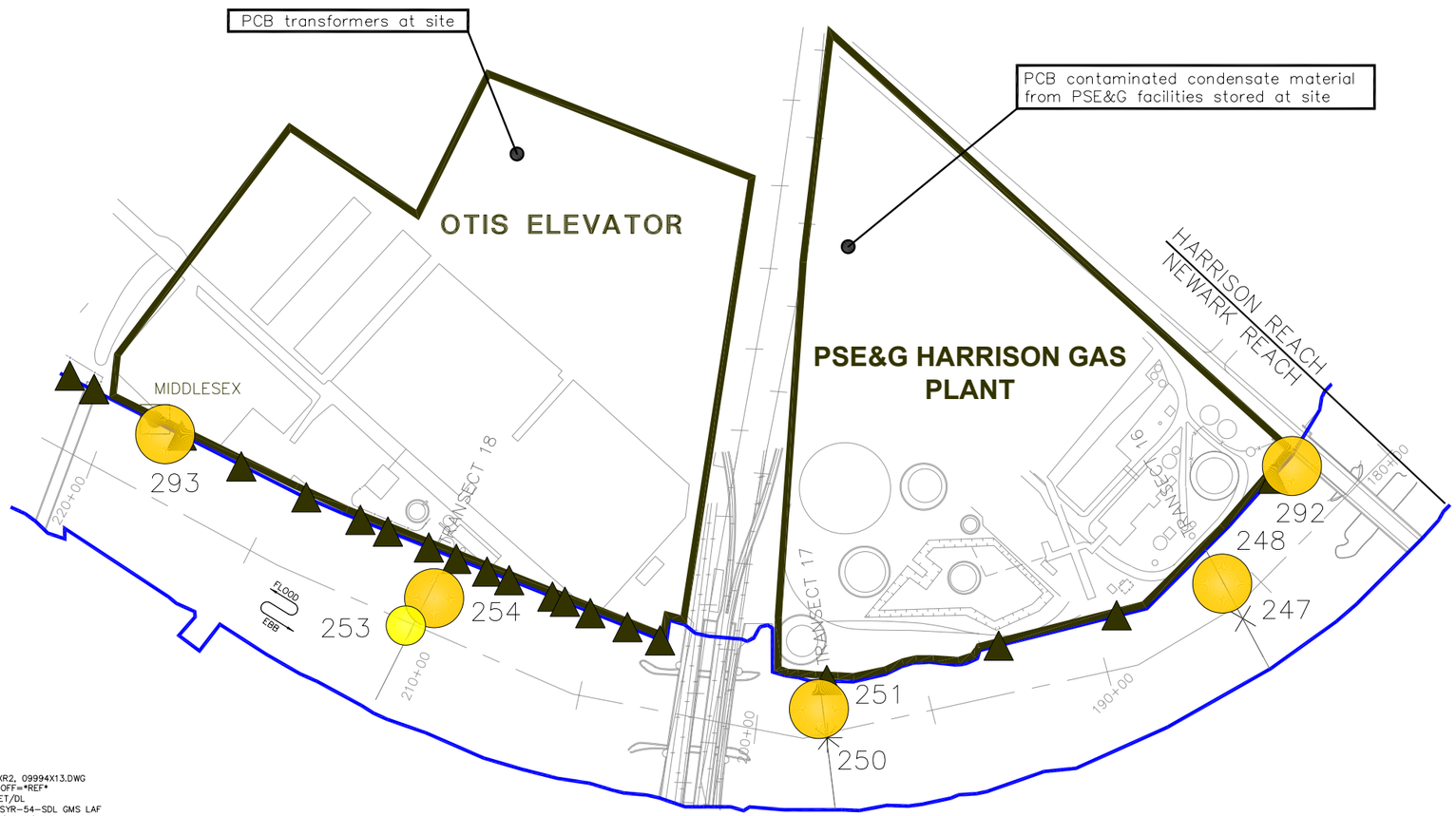
208 — RI CORE BORING LOCATION

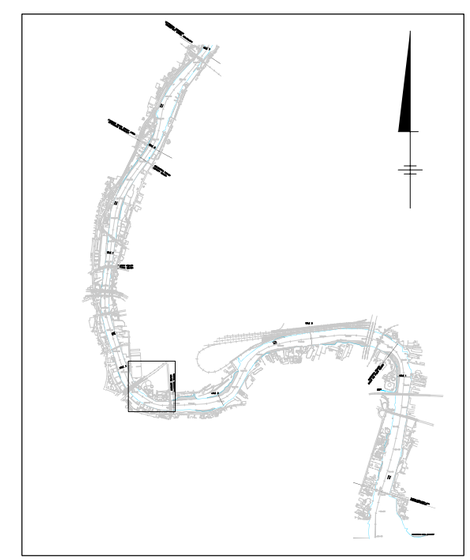
TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER

UNDERGROUND FLOW ROUTE

TRANSECT 8 — 1995 RI SEDIMENT SAMPLING TRANSECT

230+00 — USACE RIVER STATIONING





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GRAPHIC SCALE

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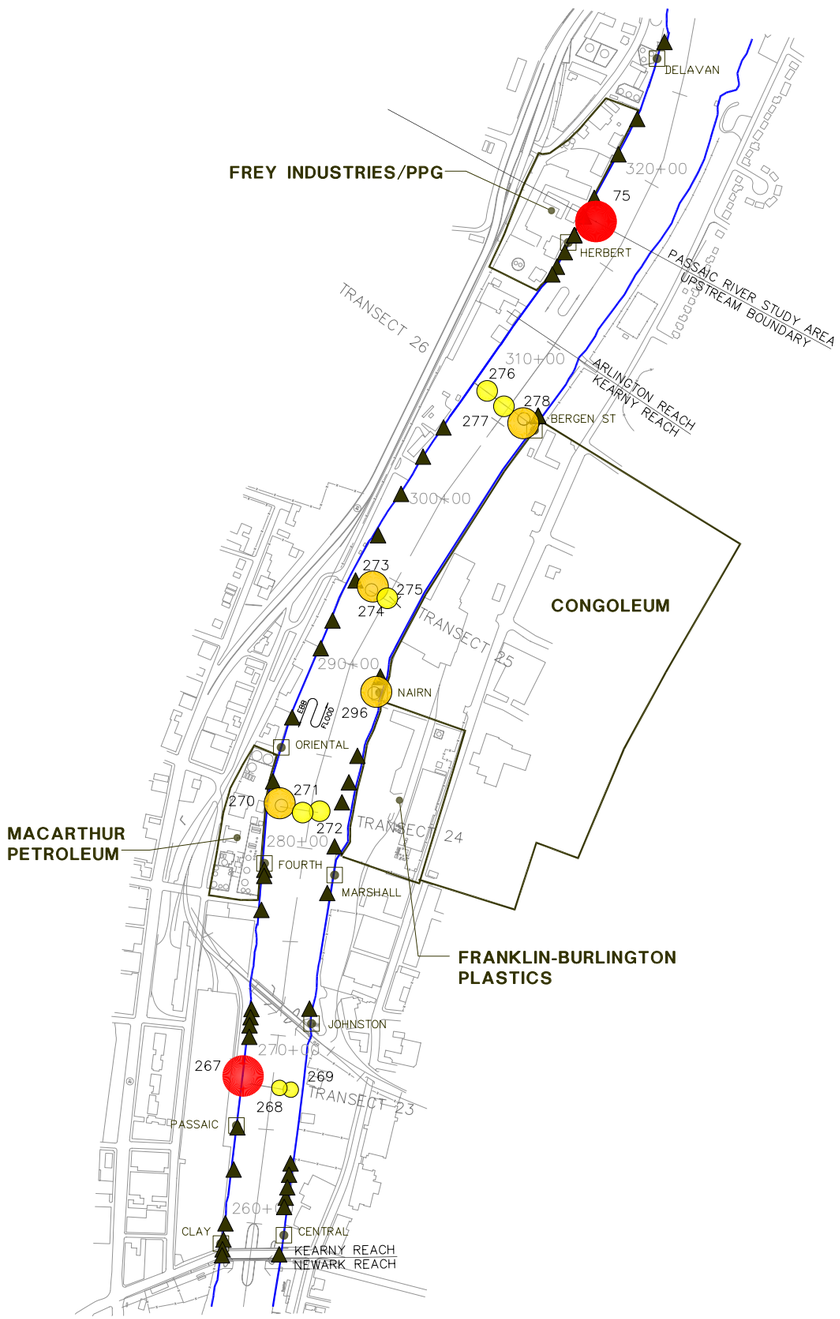
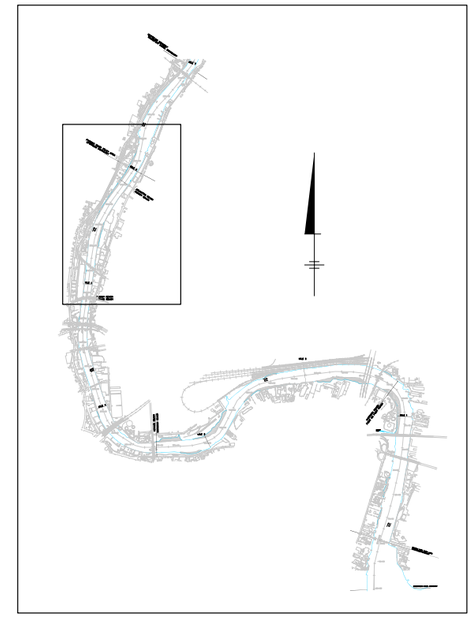
L: ON=*, OFF=*REF*
P: PAGESET/DL
8/20/02 SYR-54-SDL GMS LAF
09994063/PRSA/09994G42.DWG

PCB PRP Locations and PCB Source Areas in Kearny and Arlington Reaches of the PRSA





LEGEND:

- TIDALLY INFLUENCED FLOW
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 × RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 — 1995 RI SEDIMENT SAMPLING TRANSECT
- 230+00 — USACE RIVER STATIONING

0 400' 800'
GRAPHIC SCALE

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L: ON=*, OFF=*REF*
P: PAGESET/DL
8/20/02 SYR-54-SDL GMS LAF
09994063/PRSA/09994G28.DWG

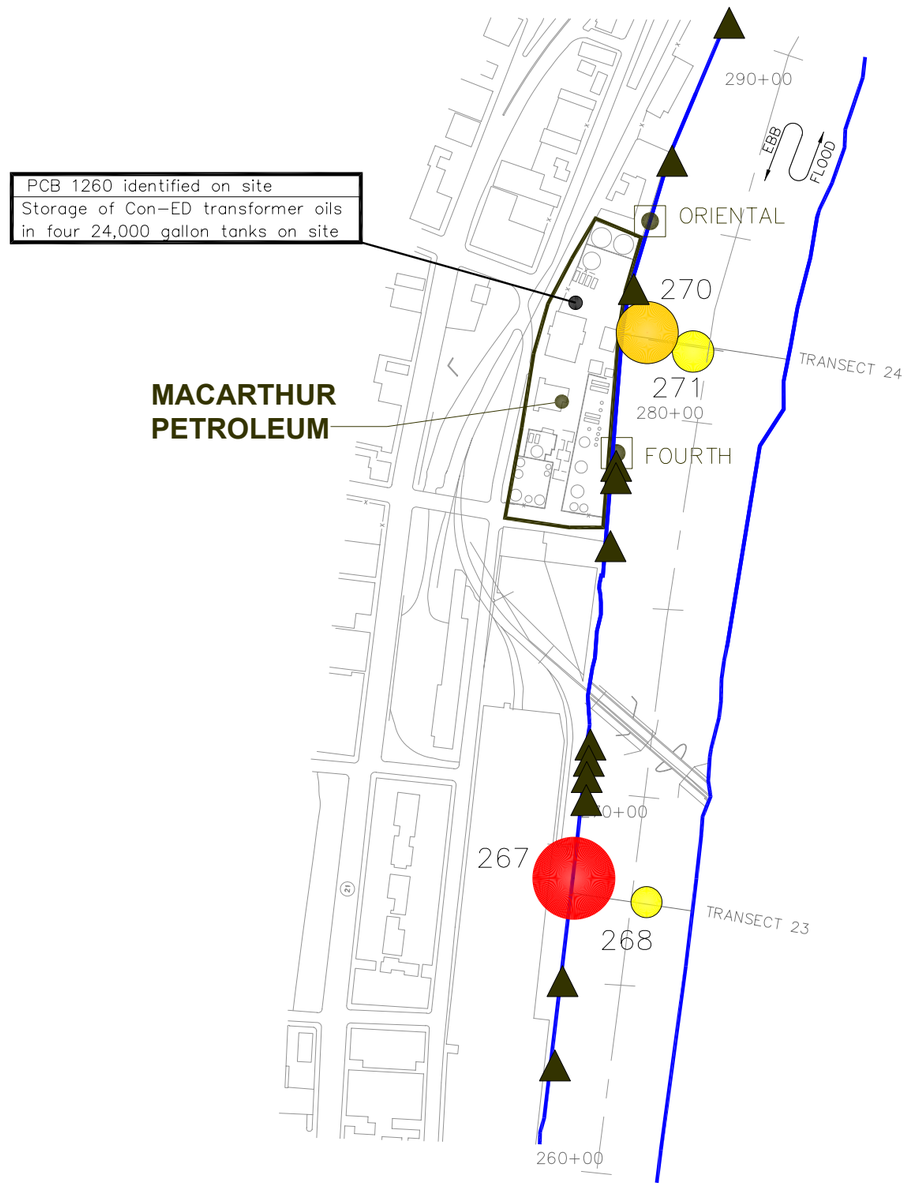
PCB PRP Locations and PCB Source Areas Along Kearny Reach Western Riverbank

Core 267				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
26701A	1242	17200	BZ77	63
			BZ105	75
			BZ114	10
			BZ118	240
			BZ118	846
			BZ189	1.7
26702A	1254	2430	BZ77	29
			BZ118	284

Core 268				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
26802B			BZ77	45
26803B			BZ77	40

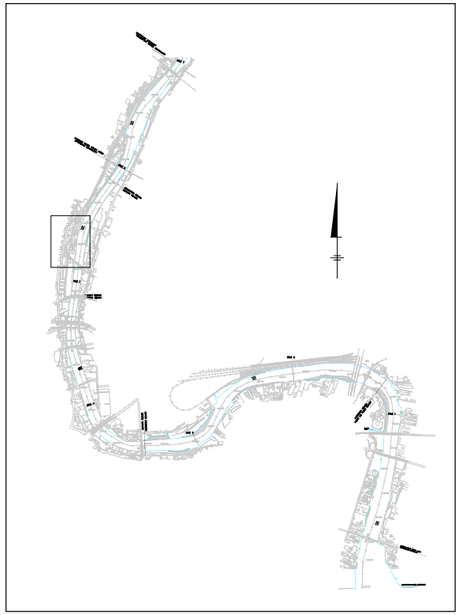
Core 270				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
27001A			BZ189	4.1
27002A	1242	6150	BZ105	94
	1254	3660	BZ114	9.8
			BZ118	250
			BZ118	197
			BZ156	32
			BZ157	6.2
			BZ167	42
			BZ189	2.9
27003A	1260	3120	BZ77	63
			BZ105	83
			BZ114	9.3
			BZ118	247
			BZ118	250
			BZ156	29
			BZ167	34
			BZ189	4.2
27004A	1248	7830	BZ77	93
	1254	6520	BZ105	200
			BZ114	21
			BZ118	321
			BZ118	470
			BZ126	1.6
			BZ156	44
			BZ157	8.7
			BZ167	61
			BZ189	2.2
27006A	1248	9460	BZ77	140
	1254	5940	BZ105	270
			BZ114	28
			BZ118	640
			BZ118	480
			BZ126	1.4
			BZ156	64
			BZ157	12
			BZ167	83
			BZ189	2.6

Core 271				
Sample	Aroclor	Conc. (ppb)	Congener	Conc. (ppb)
27102A	1260	1020		
27103A	1254	2080	BZ77	34
			BZ105	67
			BZ114	7.2
			BZ118	190
			BZ167	30
			BZ189	1.8
27104A	1248	4860	BZ77	59
	1254	3560	BZ105	120
			BZ114	12
			BZ118	330
			BZ118	289
			BZ126	1.3
			BZ156	31
			BZ157	6.2
			BZ167	44
			BZ189	1.8



LEGEND:

- TIDALLY INFLUENCED FLOW
- STORM SEWER OUTFALL
- CSO OUTFALL
- HISTORIC AND PRESENT DAY OUTFALLS
- PRP FACILITY OUTLINES
- HIGHEST PCB AROCLOR OR CONGENER CONCENTRATION
- TOP 5% PCB AROCLOR OR CONGENER CONCENTRATIONS
- TOP 25% PCB AROCLOR OR CONGENER CONCENTRATIONS. INCLUDES ALL SIGNIFICANT CONCENTRATIONS FROM PCB AROCLORS AND CONGENERS WITH LOW OCCURRENCES OF HITS.
- 208 — RI CORE BORING LOCATION
- TRIBUTARY OR DISCHARGE ROUTE TO THE PASSAIC RIVER
- UNDERGROUND FLOW ROUTE
- TRANSECT 8 — 1995 SEDIMENT SAMPLING TRANSECT
- 230+00 — USACE RIVER STATIONING



0 200' 400'
GRAPHIC SCALE

X: 0994XL2, 09994X13
L: ON=*, OFF=*REF*
P: PAGESET/DL
8/20/02 SYR-54-SDL GMS LAF
09994063/PRSA/09994G37.DWG

Conclusions: PCBs in the PRSA

- PRSA sediments contain elevated concentrations of PCBs.
- Numerous potential sources of PCBs to PRSA sediments have been identified – these “PRPs” include historical users and handlers of PCBs and PCB-contaminated products.
- PCB-contaminated soil and/or groundwater exist(s) at many of these PRPs’ upland locations.
- Many of these PRP locations have historical and/or present day discharge pathways to the PRSA.
- Additional investigation will reveal more PRPs – both within the PRSA as well as the PRRI area.

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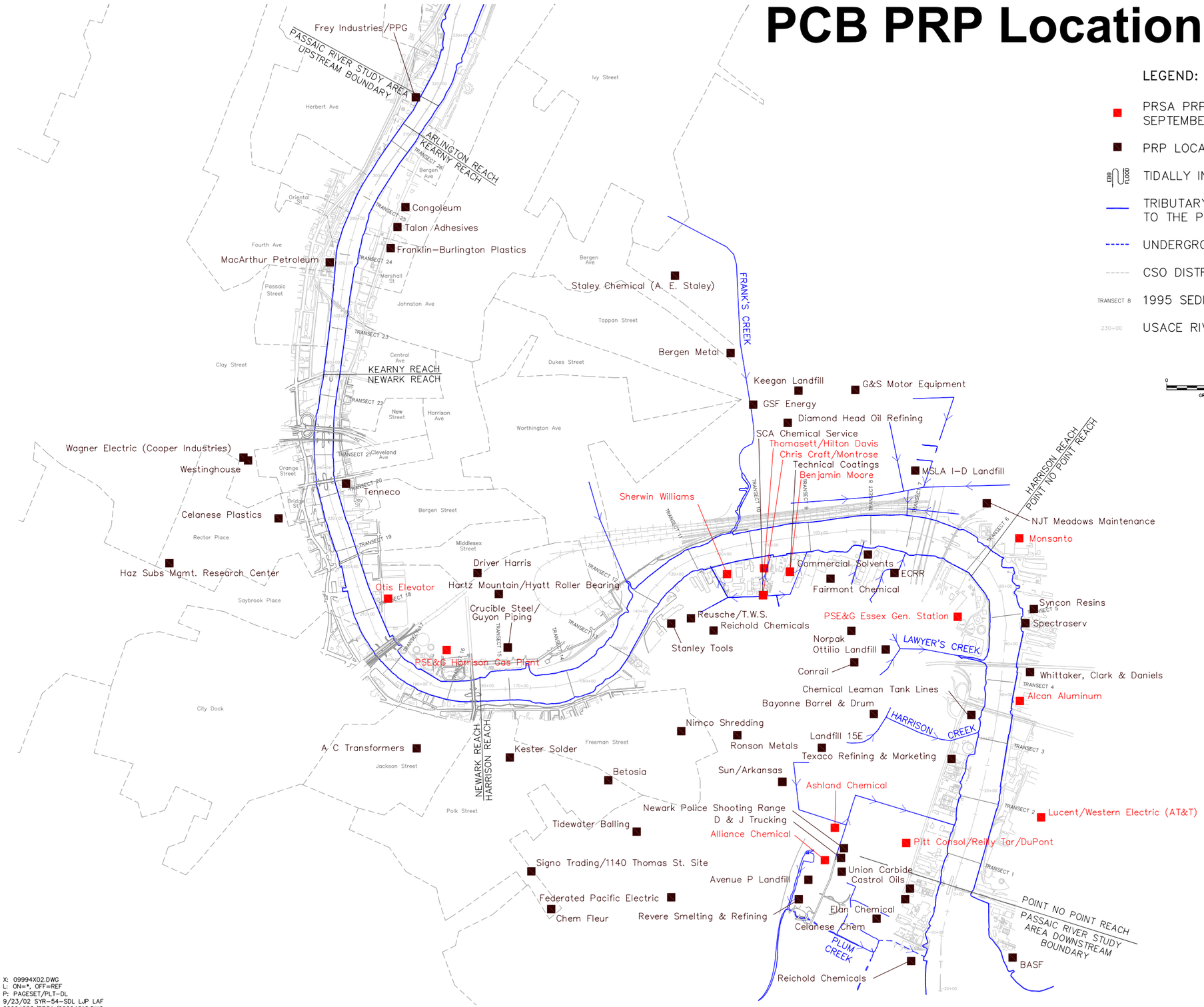
PCB PRP Locations in the PRSA



PRP:
A.C. Transformers
Alcan Aluminum
Alliance Chemical
Ashland Chemical
Avenue P Landfill
BASF
Bayonne Barrel & Drum
Benjamin Moore
Bergen Metal
Betosia
Celanese Chem
Celanese Plastics
Chem Fleur
Chemical Leaman Tank Lines
Chris Craft/Montrose
Commercial Solvents
Congoleum
Conrail
Crucible Steel/Guyon Piping
D & J Trucking
Diamond Head Oil Refining
Driver Harris
ECRR
Elan Chemical
Fairmont Chemical
Federated Pacific Electric
Franklin–Burlington Plastics
Frey Industries/PPG
G&S Motor Equipment
GSF Energy
Hartz Mountain/Hyatt Roller Bearing
Haz Subs Mgmt. Research Center
Keegan Landfill
Kester Solder
Landfill 15E
Lucent/Western Electric (AT&T)
MacArthur Petroleum
Monsanto
MSLA I–D Landfill
Newark Police Shooting Range
Nimco Shredding
NJT Meadows Maintenance
Norpak
Otis Elevator
Ottilio Landfill
Pitt Consol/Reilly Tar/DuPont
PSE&G Essex Gen. Station
PSE&G Harrison Gas Plant
Reichold Chemicals
Reusche/T.W.S.
Revere Smelting & Refining
Ronson Metals
SCA Chemical Service
Sherwin Williams
Signo Trading/1140 Thomas St. Site
Spectraserv
Staley Chemical (A. E. Staley)
Stanley Tools
Sun/Arkansas
Syncon Resins
Talon Adhesives
Technical Coatings
Tenneco
Texaco Refining & Marketing
Thomasett/Hilton Davis
Tidewater Balling
Union Carbide Castrol Oils
Wagner Electric (Cooper Industries)
Westinghouse
Whittaker, Clark & Daniels

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For Next Time:

Presentation on Sources of Dioxin in the PRRI Area

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Facts Regarding Sources of Dioxin in the PRSA/PRRI Area

- There exist PRPs that handled products and employed processes utilizing chlorinated phenols – just like the former Diamond site.
- There exist PRPs that handled chemicals and employed processes identified by USEPA as associated with the formation of dioxins.
- Sampling for dioxins at these PRP locations has been limited; but dioxins were detected where sampling was conducted .
- Many of these PRP locations have historical and/or present day discharge pathways to the PRRI area.
- Additional investigation is required.

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Overview of Report on Sources of Dioxin in the Area

- Provides background on the formation of dioxins.
- Identifies more than 100 PRPs in the area associated with actual or likely dioxin generation.
- Provides evidence regarding 5 of these PRPs.

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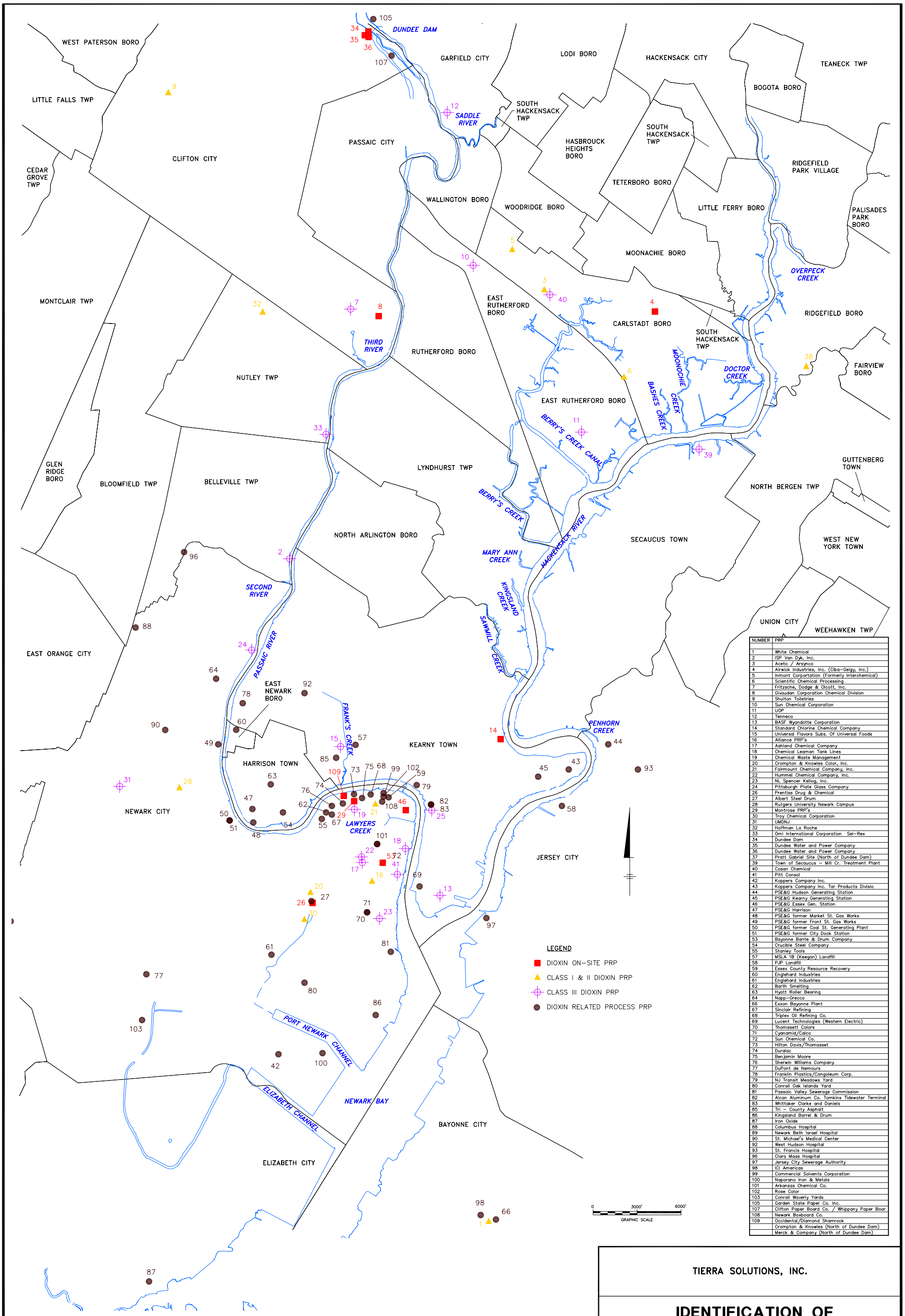

NUMBER	PRP
1	White Chemical
2	ISP Van Dyk, Inc.
3	Aceto / Arsynco
4	Airwick Industries, Inc. (Ciba-Geigy, Inc.)
5	Inmont Corportation (Formerly Interchemical)
6	Scientific Chemical Processing
7	Fritzsche, Dodge & Olcott, Inc.
8	Givaudan Corporation Chemical Division
9	Shulton Tolletries
10	Sun Chemical Corporation
11	UOP
12	Tenneco
13	BASF Wyandotte Corporation
14	Standard Chlorine Chemical Company
15	Universal Flavors Subs. Of Universal Foods
16	Alliance PRP's
17	Ashland Chemical Company
18	Chemical Leaman Tank Lines
19	Chemical Waste Management
20	Crompton & Knowles Color, Inc.
21	Fairmount Chemical Company, Inc.
22	Hummel Chemical Company, Inc.
23	NL Spencer Kellog, Inc.
24	Pittsburgh Plate Glass Company
26	Prentiss Drug & Chemical
27	Albert Steel Drum
28	Rutgers University Newark Campus
29	Montrose PRP's
30	Troy Chemical Corporation
31	UMDNJ
32	Hoffman La Roche
33	Omi International Corporation Sel-Rex
34	Dundee Dam
35	Dundee Water and Power Company
36	Dundee Water and Power Company
37	Pratt Gabriel Site (North of Dundee Dam)
39	Town of Secaucus - Mill Cr. Treatment Plant
40	Cosan Chemical
41	Pitt Consol
42	Koppers Company Inc.
43	Koppers Company Inc. Tar Products Divisio
44	PSE&G Hudson Generating Station
45	PSE&G Kearny Generating Station
46	PSE&G Essex Gen. Station
47	PSE&G Harrison
48	PSE&G former Market St. Gas Works
49	PSE&G former Front St. Gas Works
50	PSE&G former Coal St. Generating Plant
51	PSE&G former City Dock Station
53	Bayonne Barrie & Drum Company
54	Crucible Steel Company
55	Stanley Tools
57	MSLA 1B (Keegan) Landfill
58	PJP Landfill
59	Essex County Resource Recovery
60	Englehard Industries
61	Englehard Industries
62	Barth Smelting
63	Hyatt Roller Bearing
64	Napp-Grecco
66	Exxon Bayonne Plant
67	Sinclair Refining
68	Triplex Oil Refining Co.
69	Lucent Technologies (Western Electric)
70	Thomasett Colors
71	Cyanamid/Calco
72	Sun Chemical Co.
73	Hilton Davis/Thomasset
74	Duralac
75	Benjamin Moore
76	Sherwin Williams Company
77	DuPont de Nemours
78	Franklin Plastics/Congoleum Corp.
79	NJ Transit Meadows Yard
80	Conrail Oak Islands Yard
81	Passaic Valley Sewerage Commission
82	Alcan Aluminum Co. Tomkins Tidewater Terminal
83	Whittaker Clarke and Daniels
85	Tri - County Asphalt
86	Kingsland Barrel & Drum
87	Iron Oxide
88	Columbus Hospital
89	Newark Beth Israel Hospital
90	St. Michael's Medical Center
92	West Hudson Hospital
93	St. Francis Hospital
96	Clara Maas Hospital
97	Jersey City Sewerage Authority
98	ICI Americas
99	Commercial Solvents Corporation
100	Naporano Iron & Metals
101	Arkansas Chemical Co.
102	Rose Color
103	Conrail Waverly Yards
105	Garden State Paper Co. Inc.
107	Clifton Paper Board Co. / Whippany Paper Boar
108	Newark Boxboard Co.
109	Occidental/Diamond Shamrock
	Crompton & Knowles (North of Dundee Dam)
	Merck & Company (North of Dundee Dam)

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IDENTIFICATION OF DIOXIN SOURCES

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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