

PCB Mass Loading
American Scrap and Waste
SIRB ID: DE-1131
Wilmington, Delaware



BrightFields, Inc.

Appendix 2

AMERICAN SCRAP AND WASTE WILMINGTON, DELAWARE

SIRB ID: DE-1131



GENERAL SITE INFORMATION

Site Name: American Scrap and Waste

SIRB ID Number: DE-1131

Site Location and Description: The American Scrap and Waste Co. site is located within the Commerce Street site, which is part of an area called Eastside/South Wilmington located south of the Christina River in Wilmington, DE. The American Scrap and Waste property is approximately 4.23-acres in size and is located in Wilmington, Delaware bounded by Railroad Avenue to the west, Commerce Street to the north, and Canal Street to the south. Dock Street intersects the property creating two distinguished parcels.

Previous Site Uses: Much of the land that is part of the Commerce Street site has been in industrial use since the late 1800s. The American Scrap and Waste site was formerly part of the Christina River Lamp Company as late as 1893. In 1901 the Sanborn® Fire Insurance Maps display the name Consumer's Coal Company in the area of property.

Site Regulatory Status: This section briefly summarizes previous investigations performed on the site through the SIRB program. A current SIRB regulatory status is also included.

Brownfield Preliminary Assessment I (BPA I) of the Eastside/South Wilmington Area (DNREC 1996):

The study area included all of the American Scrap and Waste Co. site and covered 25 acres of the Commerce Street site. The entire areas along Commerce Street is approximately 200 acres in size and the land contains warehouses, scrap and salvage yards, vacant lands, some residential lots, auto body shops, a power relay station, boat refurbishing operation, oil and distribution facility, and light industrial and commercial operations.

The area roughly encompasses 200 acres and is bound to the north by the Christina River, the I-495 overpass to the south, and Townsend Street to the west. Christina Avenue runs north/south through the center of the area. Residential areas between Townsend Street and Christina Avenue are not included in the investigation.

A Brownfield Preliminary Assessment I (BPA I) was conducted in 1996 as a result of a series of ongoing studies to assess the impact of potential sources of contamination on the Christina River watershed. This area of south Wilmington has been targeted for future redevelopment from a



Governor's appointed task force "A Vision for the Rivers". As a result of this investigation the study area was split into three sub-areas that were to be evaluated further to different degrees.

Brownfield Preliminary Assessment II (BPA II) of the Commerce Street Site (DNREC 1997):

DNREC-SIRB, in cooperation with the U.S.E.P.A sampled surface soils, deep soils, sediments, surface water and groundwater from selected locations throughout the 25 acre study area along Commerce Street. Soil and sediment samples were field screened by the DNREC SIRB Analytical Chemist and selected samples were submitted to two laboratories for TAL/TCL confirmatory analysis.

The results of this investigation indicated that elevated levels of some metals and poly aromatic hydrocarbons (PAHs) to be present through much of the study area, likely from historic filling operations. The highest concentrations of most metals were found at the American Scrap and Waste site. In addition to the elevated metals found on this property, PCBs were found at concentrations well above the screening levels for industrial soils.

Current Regulatory Status:

In July of 1999 DNREC requested that the owner of the American Scrap and Waste Removal Site enter into a Voluntary Cleanup Agreement; however, as of June 2009 the owner has not responded to this request. As of November 2008, no further investigations have taken place on site. In addition, DNREC has developed a document entitled "Summary Report for the General Remedial Alternatives for South Wilmington" based on the information obtained from the above mentioned reports. The document outlines the appropriate remedial alternatives for the sites contained in this area based on their site contaminants.

SUMMARY OF SITE PCB INFORMATION

Site Investigation PCB Findings:

PCBs were detected in the majority of surface soil samples collected from the American Scrap and Waste property. Of the ten surface samples collected, only three of those were analyzed for confirmatory analysis. All other surface samples were screened by DNREC-SIRB laboratory for qualitative analysis. All subsurface samples were only analyzed using screening methods.

During the site inspection BrightFields identified two discernable areas that could still be contributing to overland flow. These areas were assessed separately. In both cases the maximum detected concentration (quantitative value) was used in the overland flow calculations because there were not enough distinct detections to run the appropriate statistics to develop a 95% upper confidence level of the mean concentration.

Concentrations of PCBs remaining on Site			
Sample Matrix	Corresponding Figure	Analytical Methods	Range of Total PCBs
Surface Soil	Figure 2	Method 8082 and Immunoassay	Not detected to 180 mg/kg
Subsurface Soil (unsaturated)	Figure 3	No Criteria Available	Not analyzed
Subsurface Soil (saturated)	Figure 4	Immunoassay	Not detected to > 1 <5 mg/kg
Groundwater	Figure 5	No Criteria Available	Not analyzed

A summary of all samples collected for PCBs are presented in the attached Tables 1 through 2.

Acreage where PCBs detected:

The total area associated with surface soils impacted by PCBs is 3.18 acres. Based on the available data there are no subsurface saturated soils that are impacted by PCBs. The total area associated with subsurface soils in contact with groundwater is 4.24 acres.

PCB Remediation Status:

No remedial activities have been required or taken place on site as of December 2008.

PCB MASS LOADING SUMMARY

The PCB mass loading rate to surface water via overland flow and via groundwater transport were estimated for the American Scrap and Waste property. A summary of the results is included below and the details of the calculations are included as attachments to this Appendix.

OVERLAND FLOW:

Overland flow has been determined on this site by using the Revised Universal Soil Loss Equation (RUSLE). The RUSLE predicts the long term average annual rate of erosion on an area based on rainfall patterns, soil type, topography, cover/canopy factors and support management practices. These specific factors are site specific and rely on local information of the site.

Ground Cover and Canopy:

A site inspection was performed on August 28, 2008 to estimate the current site ground cover and canopy. Due to the size of the site and the different cover systems, BrightFields identified two separate areas of concern. The cover/management factor (C) assigned to the site and associated flow path is 0.45, which corresponds to areas of bare ground. Photographs of the site ground cover and canopy are attached.

Site Sediment and Erosion Control Practices:

There are currently no erosion and control practices being implemented on the American Scarp and Waste property.

Input Factors and Results:

A breakdown of the individual factors is presented below with a brief explanation of their choice.

Area 1: Southwest portion of the property

RUSLE Factors	Values Provided	Explanation of Selection
R = rainfall-runoff erosivity index (10 ² ft-tonf-in/ac-hr)	170	An appropriate value for R for the site was determined from plots of Rainfall patterns for the Eastern U.S. (Wischmeier and Smith, 1978).
K = soil erodibility (0.01 tonf acre hr/acre ft-ton in)	0.15	The soil erodibility factor was chosen based on the information provided by the boring logs represented in the Brownfield Preliminary Assessment for

		Commerce Street (DNREC 1997).
RUSLE Factors	Values Provided	Explanation of Selection
ls = topographic factor (dimensionless)	0.060	The slope length was estimated to 634 feet, which is the distance between the centroid and the Christina River along the overland flow path. The assumed slope (0.3 ft/ft) and slope length were used to calculate a topographic factor of 0.060 from the USGS windows based application.
C = cover/management factor (dimensionless)	0.45	The cover/management factor C assigned to the site by the USGS windows based application was 0.45, which corresponds to bare ground
P = support practice factor (dimensionless)	1.0	There are currently no support practice factors being implemented on the American Scrap and Waste Property.

The average annual erosion rate is based on the windows based RUSLE2 program (RUSLE2 License, version 2006-Jul-24).

The total PCB loading via overland flow for Area 1 is 2 grams per year. Please see attached table for specific variables.

Area 2: Northeast portion of the property

RUSLE Factors	Values Provided	Explanation of Selection
R = rainfall-runoff erosivity index (10 ² ft-tonf-in/ac-hr)	170	An appropriate value for R for the site was determined from plots of Rainfall patterns for the Eastern U.S. (Wischmeier and Smith, 1978).
K = soil erodibility (0.01 tonf acre hr/acre ft-ton in)	0.15	The soil erodibility factor was chosen based on the information provided by the boring logs represented in the Brownfield Preliminary Assessment for Commerce Street (DNREC 1997).
ls = topographic factor (dimensionless)	0.160	The slope length was estimated to 245 feet, which is the distance between the centroid and the closest storm water discharge location along the overland flow path. The assumed slope (1.0 ft/ft) and slope length were used to calculate a topographic factor of 0.160 from the USGS windows based application.
C = cover/management factor (dimensionless)	0.45	The cover/management factor C assigned to the site by the USGS windows based application was 0.45, which corresponds to bare ground.
P = support practice factor (dimensionless)	1.0	There are currently no support practice factors being implemented on the American Scrap and Waste

		Property.
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The average annual erosion rate is based on the windows based RUSLE2 program (RUSLE2 License, version 2006-Jul-24).

The total PCB loading via overland flow for Area 2 is 500 grams per year. Please see attached table for specific variables.

Uncertainty Analysis Associated with Overland Flow:

Specific Areas and Degree of Uncertainty for the American Scrap and Waste

	Samples Per Acre (site)	Chemical Data Quality*	Topography	Soil Type	Site Coverage	Map Quality	Distance to Discharge Points
Site Specific Information	2.6	Immunoassay	Estimated using topography	Logs that are located within the area of concern	Based on a limited site assessment.	Scaled Map	722 feet 239 feet
Degree of Uncertainty	Moderate	Moderate to High	Moderate	Moderate	Moderate	Moderate	High

* Primary analysis used in the historical samples

Sources of uncertainty for the American Scrap and Waste property include the following: analytical data for TP-12 and TP13 had some extreme inconsistencies and the laboratory had to report the samples as estimated values. The reporting limits for the other Aroclor compounds could not be represented in the tables because the laboratory choose the highest concentration reported between the dual column analysis for the individual Aroclors that had reported concentrations. The topography on the site suggests that the overland flow from Area 1 would pond in the corner of Dock and Canal Streets; however, because of the relatively close proximity of the Christina River, BrightFields assumed that during extreme weather conditions the overland flow would force the sediments toward the river. Based on these considerations the overall level of uncertainty associated with PCB mass loading from the American Scrap and Waste site is **moderate**.

GROUNDWATER DISCHARGE ANALYSIS

Groundwater discharge is based on the hydraulic conductivity of the soil, the groundwater gradient, and the cross-sectional area of the aquifer. A breakdown of the individual factors used in the Darcy equation is presented below.

Because PCBs were detected in saturated soil, but not in groundwater, the calculated

concentration of PCBs in pore water, based on partitioning, was used to calculate the mass loading. The calculated PCB concentration in the pore water ranges from 0.548 to 2.74 µg/L. The calculations are presented in Table B in the groundwater transport calculations attachment.

Input Factors:

A breakdown of the individual factors is presented below with a brief explanation of their choice.

Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
K = Hydraulic Conductivity (ft/day)	14.2	42.5	Drilling logs from the American Scrap & Waste property were used to evaluate the lithology beneath the site. An examination of the logs shows that the groundwater being monitored is within a moderately coarse-grained fill. The fill unit is primarily a fine sand. The hydraulic conductivity for fine sand ranges from approximately 5×10^{-3} to 1.5×10^{-2} cm/sec (Cernica, 1995).
I = Horizontal Groundwater Gradient	0.01	0.01	Because there is no apparent groundwater flow data for the site, the horizontal hydraulic gradient could not be directly calculated. However, because the groundwater surface frequently mimics topography, an estimate of the gradient was made based on surface slope.
Saturated Thickness (ft)	1.5	4.0	Based on the borings logs, the saturated zone is between 1.5 and 4 feet thick.
Lateral Discharge Distance (ft)	405	405	The lateral discharge distance was estimated to be equal to the length of the PCB impacted area measured perpendicular to the Christina River.
A= Cross-Sectional Area (ft ²)	608	1,620	Calculated from the saturated thickness and lateral discharge distance.
Groundwater PCB Concentration (µg/L)	0.548	2.74	The maximum concentration observed in the saturated subsurface soil (2.5 mg/kg) was used to determine the estimated concentration in groundwater.
Distance to Discharge point (ft)	459		Approximate distance from property boundary to closest surface water location.

Mass Loading Via Groundwater Transport Result:

The groundwater discharge is 2,400 to 19,000 L/day (attached Table A). The maximum detected soil concentrations from each subarea were used to calculate the groundwater concentrations for the loading estimate. The estimated minimum and maximum contaminant mass loading contributions are shown in the Table C in the groundwater transport calculations attachment. As previously described, these calculations are highly conservative (protective), and they

overestimate the actual mass loading because they assume that there are no contaminant losses due to degradation, dispersion, sorption, volatilization, etc.

The total PCB loading via groundwater discharge is between 2.5 and 19 grams per year (attached Table C).

Uncertainty Analysis Associated with Groundwater Transport:

Specific Areas and Degree of Uncertainty for the American Scrap and Waste Site

	Groundwater PCB Concentration	Hydraulic Conductivity	Horizontal Groundwater Gradient	Saturated Thickness	Lateral Discharge Distance	Distance to Discharge point
Site Specific Information	Groundwater concentration based on saturated soil screening data	Conductivity based on good quality logs	Gradient based on low quality surface topography	Few logs, inconsistent saturated thickness	Poor sample control/ quality, poor ground-water flow data	459 feet
Degree of Uncertainty	High	Moderate	High	Moderate	High	High

Based on this evaluation the overall uncertainty associated with the American Scrap and Waste site is **moderate to high**.

Site References:

Department of Natural Resources and Environmental Control (DNREC 1999). Voluntary Cleanup Agreement and Scope of Work. July 12, 1999.

DNREC, 1997. Brownfield Preliminary Assessment of the Commerce Street Study Area. June 1997.

DNREC, 1996. Brownfield Preliminary Assessment I (BPA I) of the Eastside/South Wilmington Area. 1996.

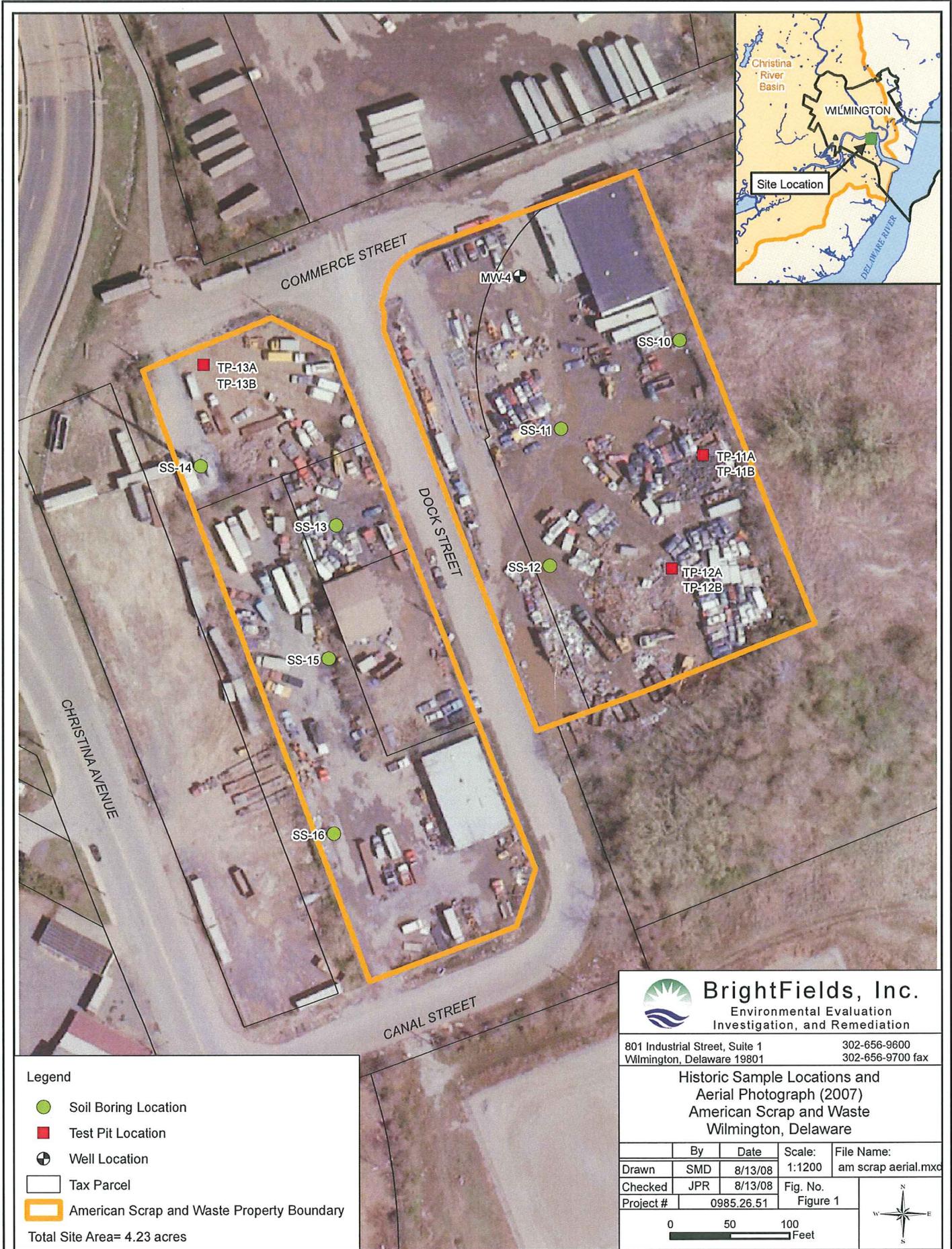
DNREC. Site Investigation and Restoration (SIRB) Branch Brief Summary of Activities at the American Scrap and Waste Inc.

PCB Mass Loading
American Scrap and Waste
SIRB ID: DE-1131
Wilmington, Delaware



BrightFields, Inc.

Figures



Legend

- Soil Boring Location
 - Test Pit Location
 - ⊕ Well Location
 - Tax Parcel
 - American Scrap and Waste Property Boundary
- Total Site Area= 4.23 acres



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Environmental Evaluation
Investigation, and Remediation

801 Industrial Street, Suite 1
Wilmington, Delaware 19801

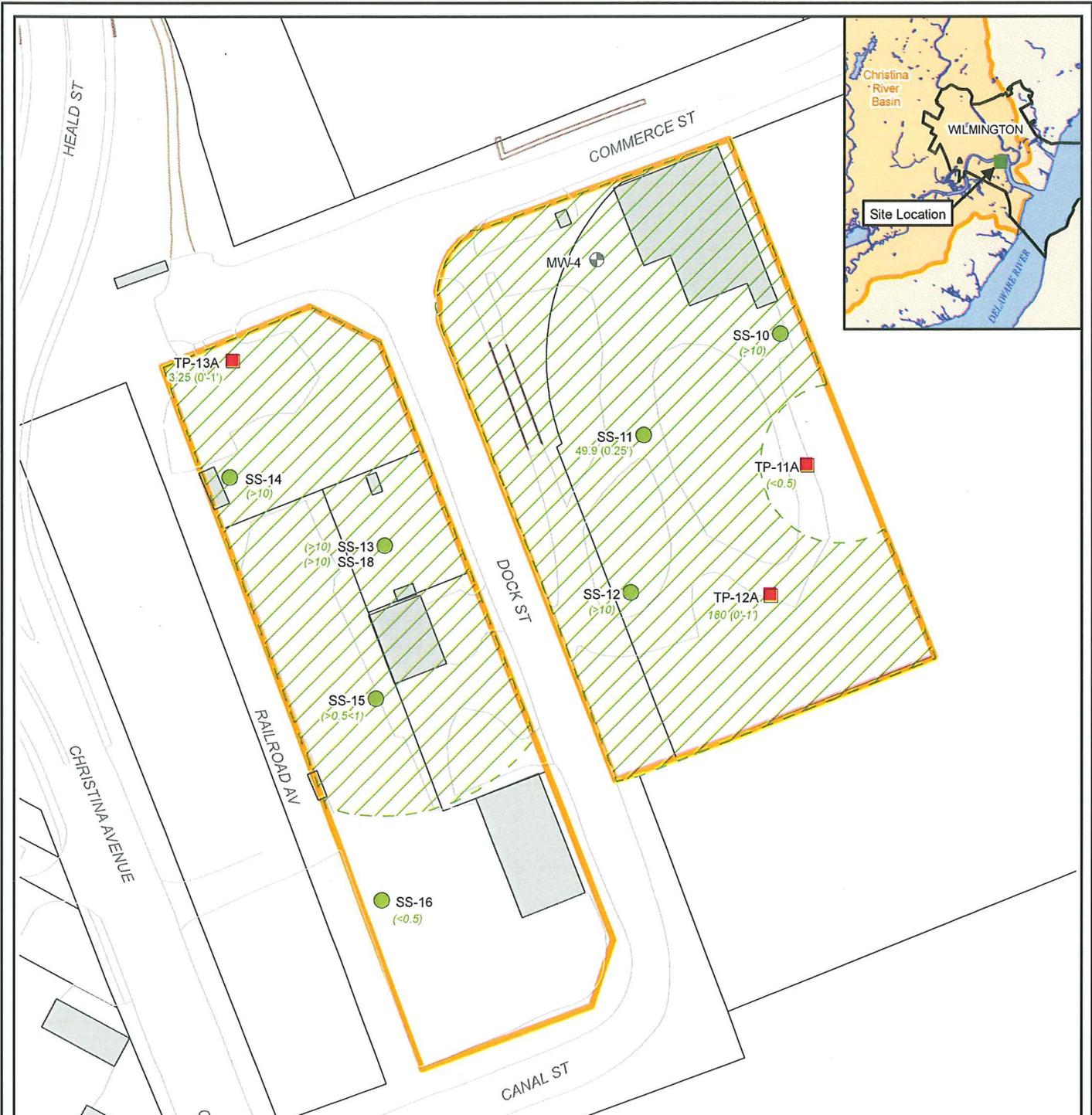
302-656-9600
302-656-9700 fax

**Historic Sample Locations and
Aerial Photograph (2007)
American Scrap and Waste
Wilmington, Delaware**

	By	Date	Scale:	File Name:
Drawn	SMD	8/13/08	1:1200	am scrap aerial.mxd
Checked	JPR	8/13/08	Fig. No.	
Project #	0985.26.51		Figure 1	

0 50 100
Feet





Legend

- 49.9 (0'-1') Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (>10) Screening Data
- Soil Boring Location
- Test Pit Location
- ⊕ Well Location
- ▨ Estimated PCB Distribution
- ▭ Existing Building
- ▭ Tax Parcel
- ▭ American Scrap and Waste Property Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs

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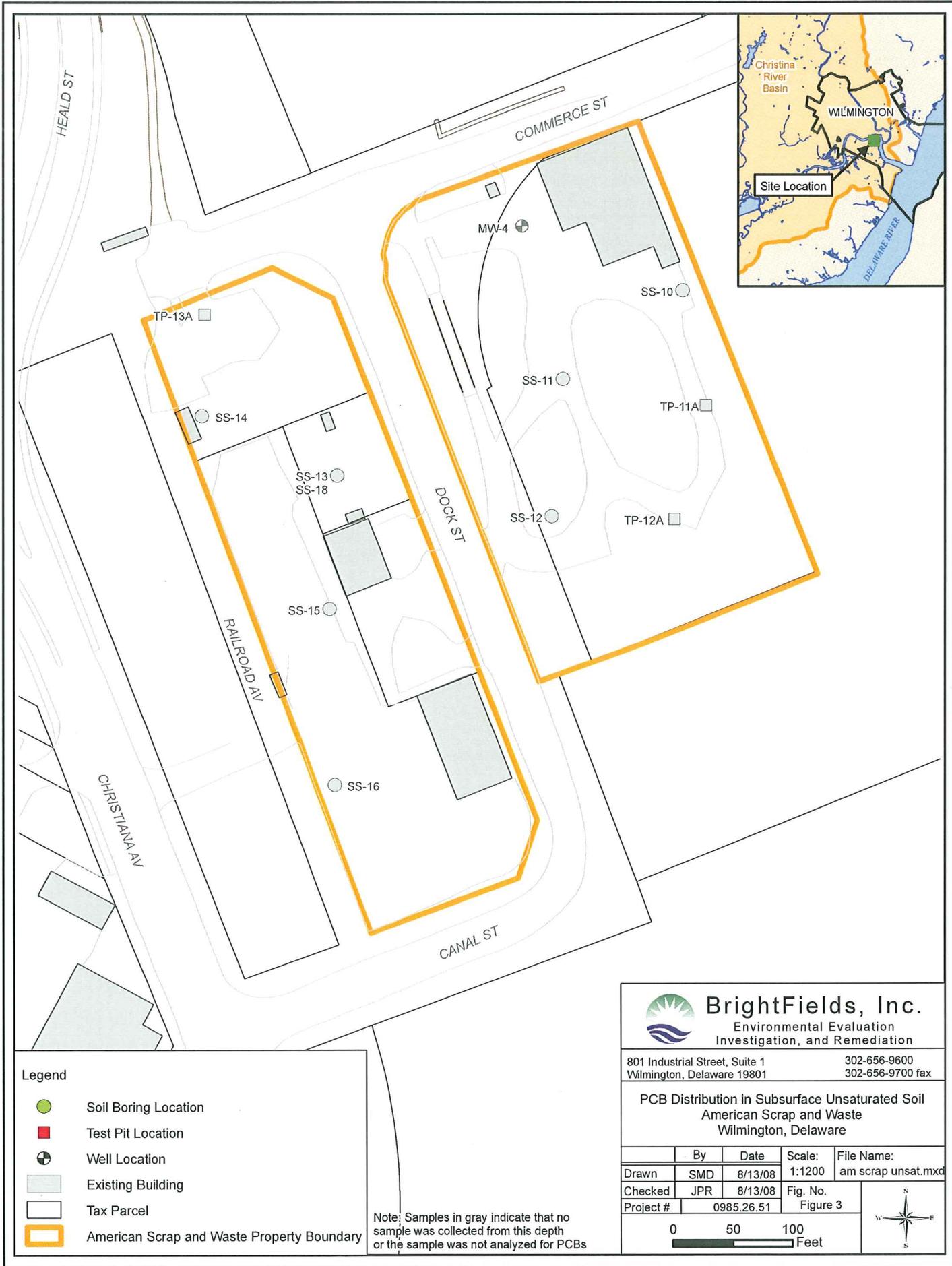
801 Industrial Street, Suite 1
Wilmington, Delaware 19801

302-656-9600
302-656-9700 fax

**PCB Distribution in Surface Soil (0'-2' bgs)
American Scrap and Waste
Wilmington, Delaware**

By	Date	Scale:	File Name:
SMD	9/17/08	1:1200	am scrap 0-2.mxd
Checked	JPR	9/17/08	Fig. No.
Project #	0985.26.51	Figure 2	

0 50 100 Feet



Legend

- Soil Boring Location
- Test Pit Location
- ⊕ Well Location
- Existing Building
- Tax Parcel
- American Scrap and Waste Property Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs



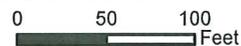
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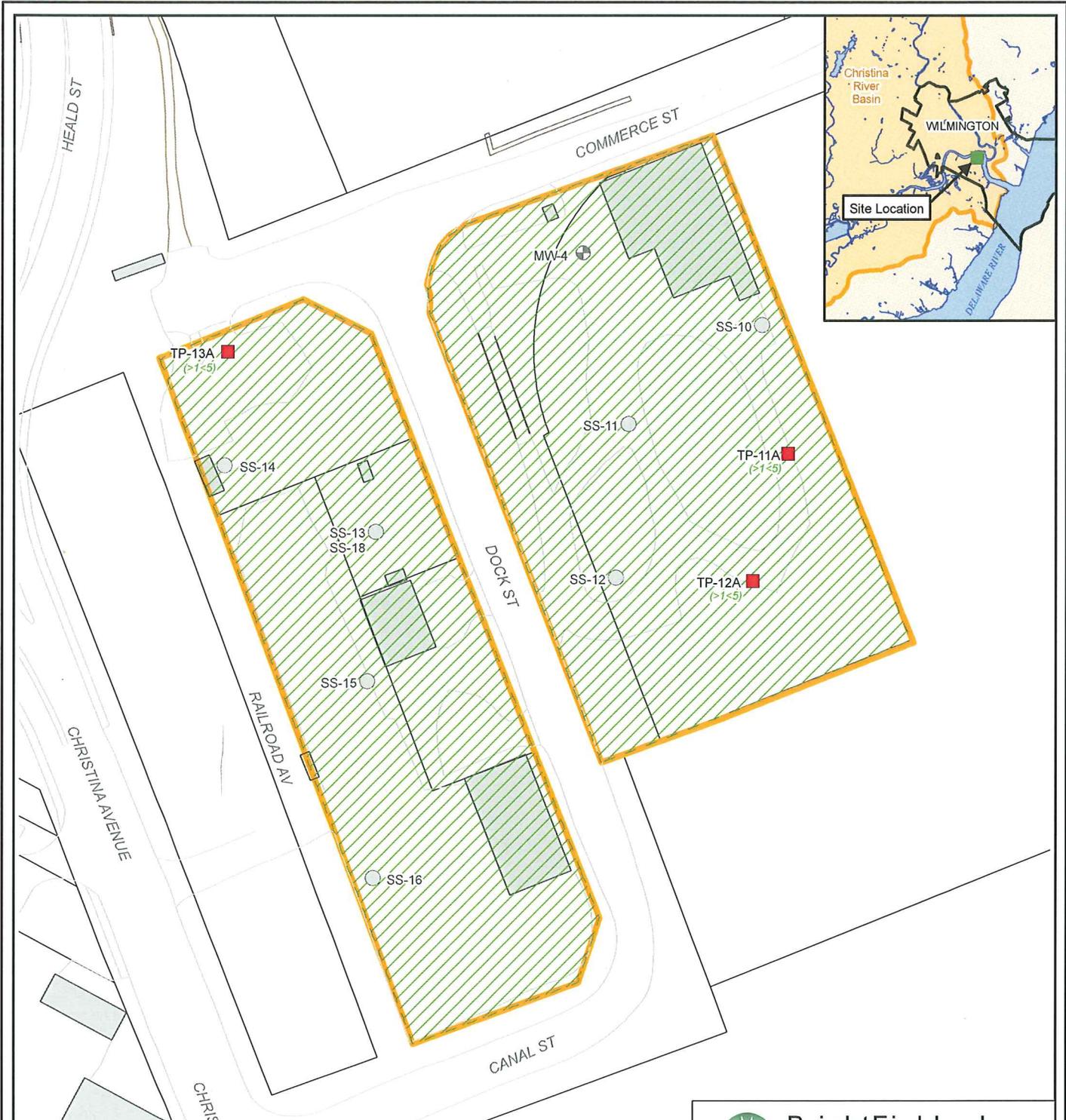
801 Industrial Street, Suite 1
Wilmington, Delaware 19801

302-656-9600
302-656-9700 fax

PCB Distribution in Subsurface Unsaturated Soil
American Scrap and Waste
Wilmington, Delaware

	By	Date	Scale:	File Name:
Drawn	SMD	8/13/08	1:1200	am scrap unsat.mxd
Checked	JPR	8/13/08	Fig. No.	
Project #	0985.26.51		Figure 3	





Legend

- (>1<5) Screening Data (mg/Kg)
- Soil Boring Location
- Test Pit Location
- ⊕ Well Location
- ▨ Estimated PCB Distribution
- ▭ Existing Building
- ▭ Tax Parcel
- ▭ American Scrap and Waste Property Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs



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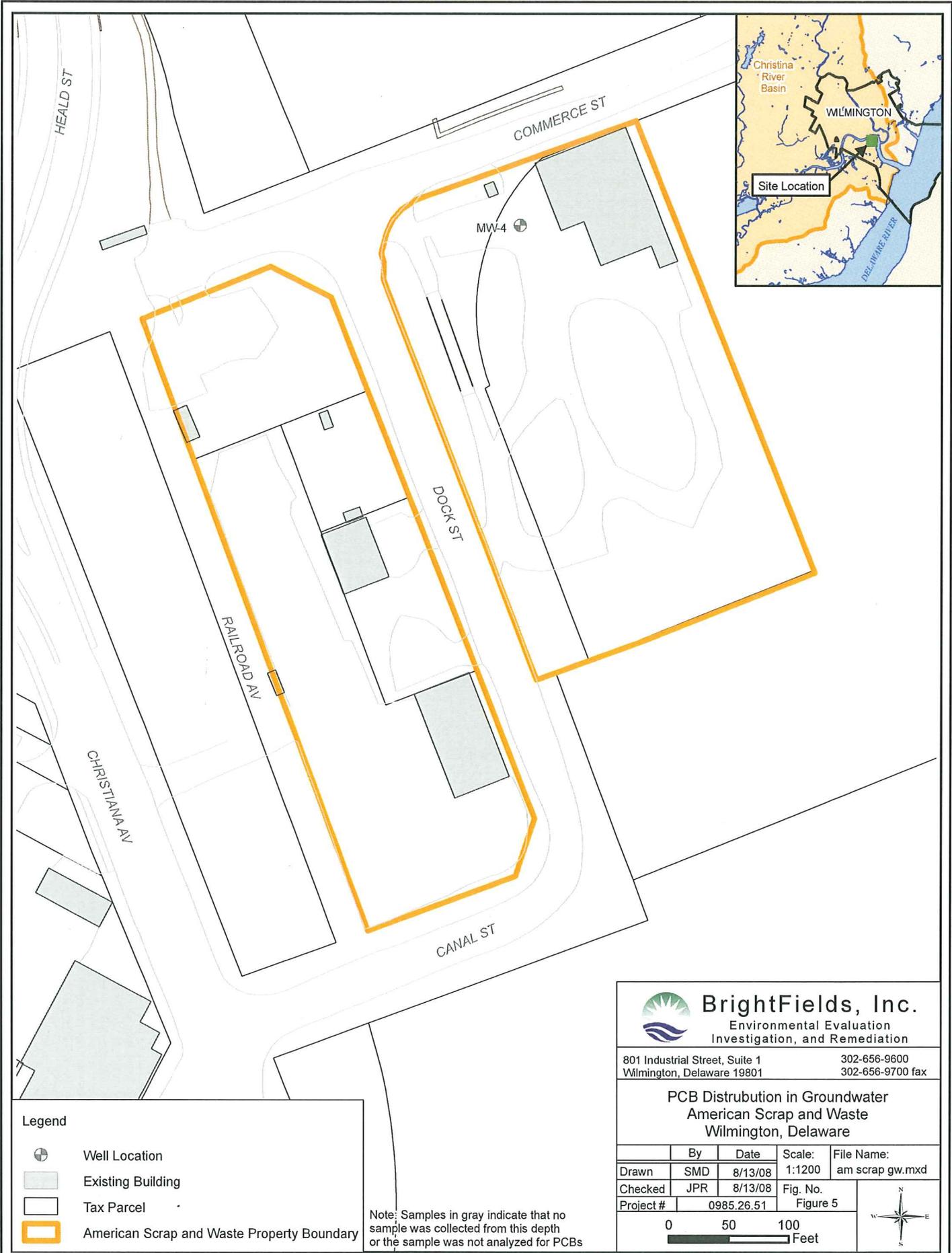
**PCB Distribution in Subsurface Saturated Soil
American Scrap and Waste
Wilmington, Delaware**

	By	Date	Scale:	File Name:
Drawn	SMD	8/13/08	1:1200	am scrap sat.mxd
Checked	JPR	8/13/08	Fig. No.	
Project #	0985.26.51		Figure 4	

0 50 100

Feet





Legend

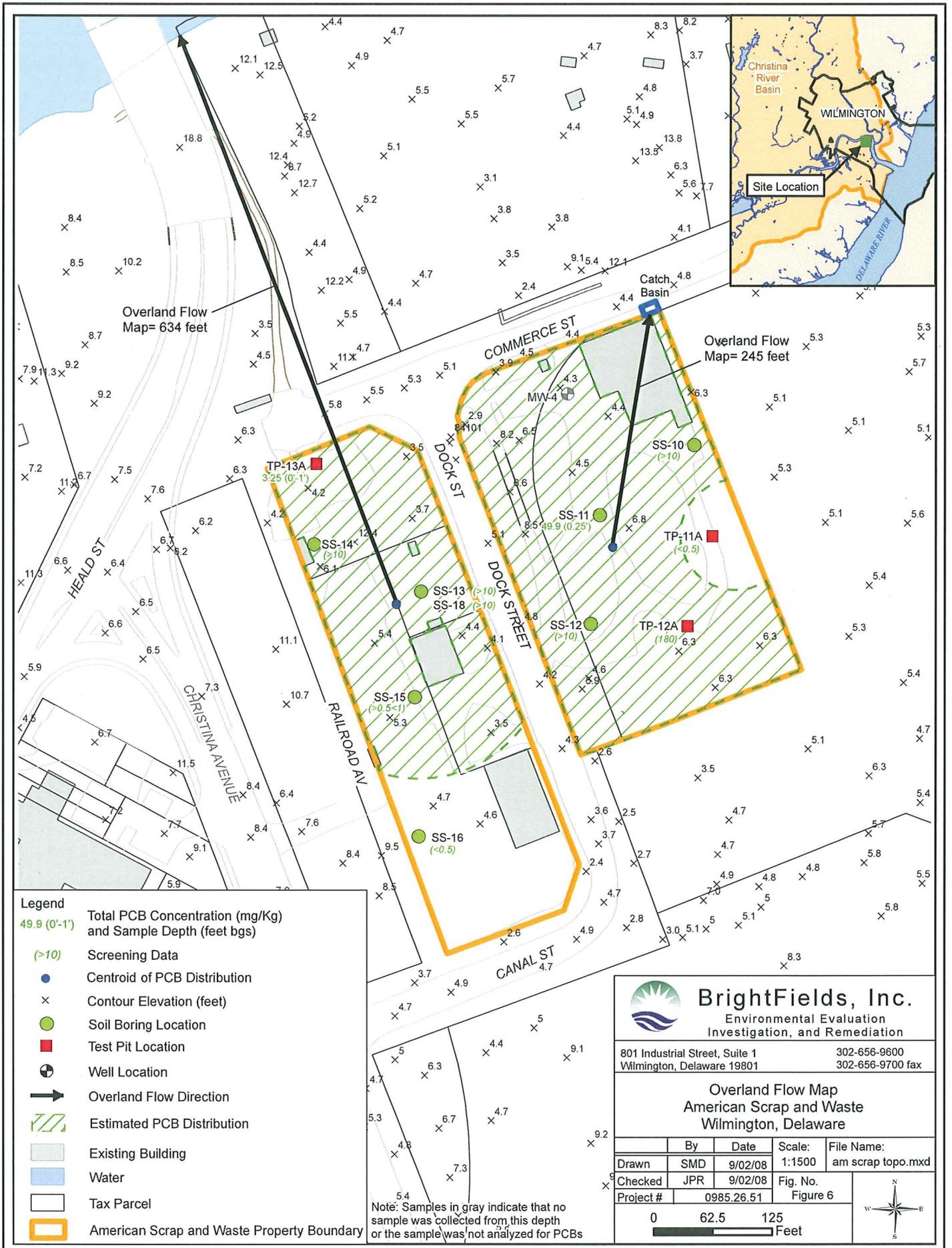
-  Well Location
-  Existing Building
-  Tax Parcel
-  American Scrap and Waste Property Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs



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Environmental Evaluation
Investigation, and Remediation

801 Industrial Street, Suite 1 Wilmington, Delaware 19801		302-656-9600 302-656-9700 fax		
PCB Distribution in Groundwater American Scrap and Waste Wilmington, Delaware				
	By	Date	Scale:	File Name:
Drawn	SMD	8/13/08	1:1200	am scrap gw.mxd
Checked	JPR	8/13/08	Fig. No.	
Project #	0985.26.51		Figure 5	
0 50 100 Feet				



Legend

- 49.9 (0'-1') Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (>10) Screening Data
- Centroid of PCB Distribution
- × Contour Elevation (feet)
- Soil Boring Location
- Test Pit Location
- ⊕ Well Location
- ➔ Overland Flow Direction
- ▨ Estimated PCB Distribution
- ▭ Existing Building
- ▭ Water
- ▭ Tax Parcel
- ▭ American Scrap and Waste Property Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs

BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation

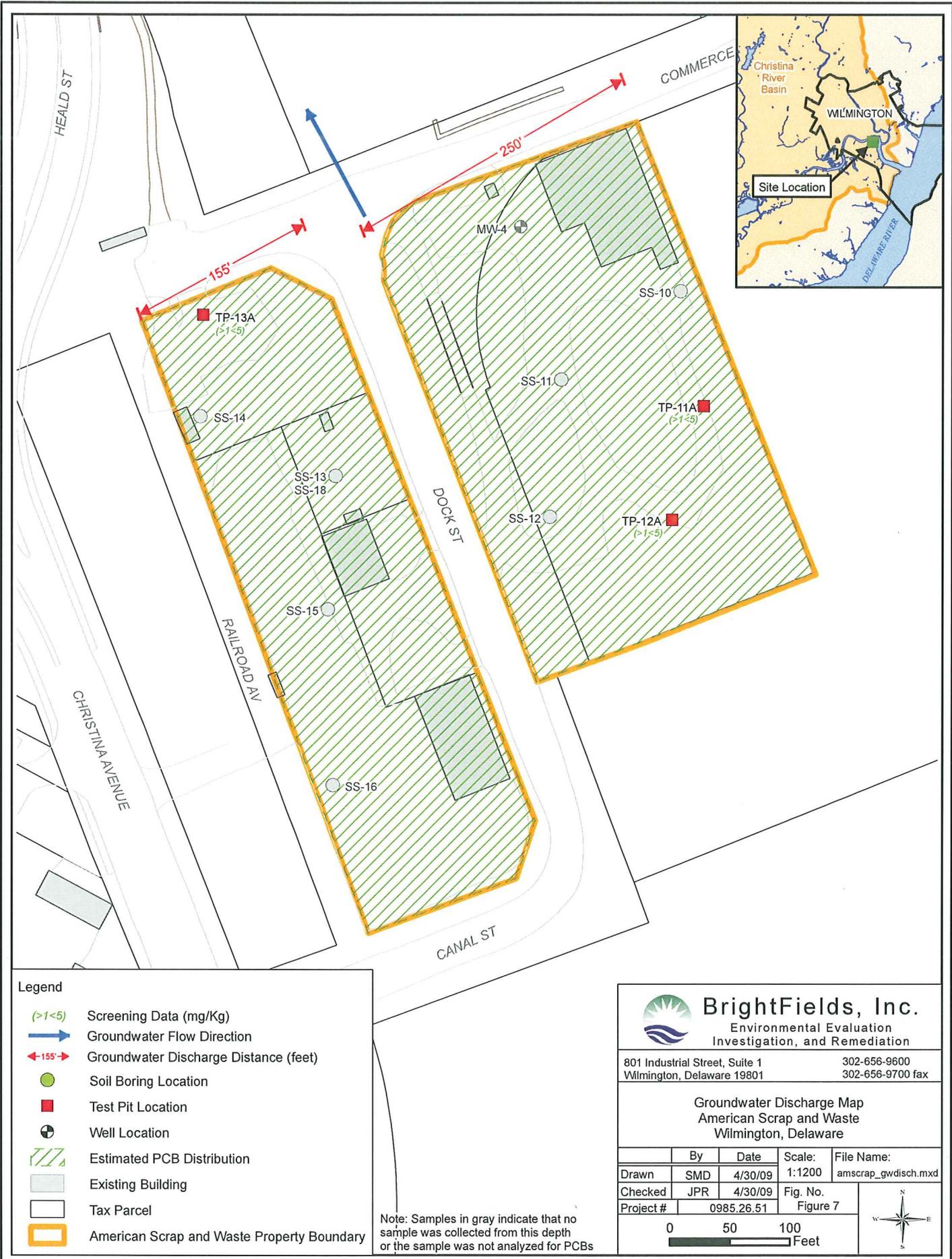
801 Industrial Street, Suite 1
 Wilmington, Delaware 19801

302-656-9600
 302-656-9700 fax

Overland Flow Map
American Scrap and Waste
Wilmington, Delaware

By	Date	Scale:	File Name:	
Drawn	SMD	9/02/08	1:1500	am scrap topo.mxd
Checked	JPR	9/02/08	Fig. No.	
Project #	0985.26.51		Figure 6	

0 62.5 125 Feet



Legend

- (>1<5) Screening Data (mg/Kg)
- Groundwater Flow Direction
- ←155'→ Groundwater Discharge Distance (feet)
- Soil Boring Location
- Test Pit Location
- ⊕ Well Location
- ▨ Estimated PCB Distribution
- Existing Building
- Tax Parcel
- American Scrap and Waste Property Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs



BrightFields, Inc.
Environmental Evaluation
Investigation, and Remediation

801 Industrial Street, Suite 1 Wilmington, Delaware 19801		302-656-9600 302-656-9700 fax		
Groundwater Discharge Map American Scrap and Waste Wilmington, Delaware				
	By	Date	Scale:	File Name:
Drawn	SMD	4/30/09	1:1200	amscrap_gwdisch.mxd
Checked	JPR	4/30/09	Fig. No.	
Project #	0985.26.51		Figure 7	
0 50 100 Feet				

PCB Mass Loading
American Scrap and Waste
SIRB ID: DE-1131
Wilmington, Delaware



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Tables

Table 1
PCB Laboratory Analytical Results For Soil
American Scrap and Waste
Wilmington, DE
SIRB ID: DE-1131

Sample ID Sampling Depth (feet bgs) Sampling Date Units Report Issued	DNREC URS for Protection of Human Health Non-critical Water Resource Area mg/Kg		SS-11 0.25' 11/19/96 mg/Kg DNREC (1997)	TP-12A 0'-1' 11/19/96 mg/Kg DNREC (1997)	TP-13A 0'-1' 11/19/96 mg/Kg DNREC (1997)
	Unrestricted Use	Restricted Use			
PCBs					
Aroclor-1016	5	82	nca	nca	nca
Aroclor-1221	0.3	3	nca	nca	nca
Aroclor-1232	0.3	3	nca	nca	nca
Aroclor-1242	0.3	3	38	nca	nca
Aroclor-1248	0.3	3	nca	30	1.5
Aroclor-1254	0.3	3	6.8	70	1.1
Aroclor-1260	0.3	3	5.1	80	0.65
Total PCBs	1	1	49.9	180	3.25

DNREC - Brownfield Preliminary Assessment II for Commerce Street (June 1997)

Qualifiers

U - The compound was not detected above the indicated laboratory detection limit

NR - Not analyzed

nca - no criteria available

bold - concentration is above DNREC URS unrestricted use criteria

shaded - concentration is above DNREC URS restricted use criteria

Table 2
 DNREC PCB Screening Data
 American Scrap and Waste
 Wilmington, DE
 SIRB ID: DE-1131

Sample ID	Sample Depth	Investigation Report	Sample Date	DNREC URS for Protection of Human Health (Non-critical Water Resource Area) Unrestricted Use (mg/kg)	Total PCBs (mg/kg)
SS-12	0.25'	DNREC	11/19/96	1	>10
SS-10	0.25'	DNREC	11/19/96	1	>10
SS-14	0.084'	DNREC	11/19/96	1	>10
SS-13	0.084'	DNREC	11/19/96	1	>10
SS-15	0.25'	DNREC	11/19/96	1	>0.5<1
SS-16	0.25'	DNREC	11/19/96	1	>0.5<1
TP-11A	0'-1'	DNREC	11/19/96	1	<0.5
TP-12B	5'	DNREC	11/19/96	1	>1<5
TP-13B	4.5'-5'	DNREC	11/19/96	1	>1<5
TP-11B	7'-8'	DNREC	11/19/96	1	>1<5

DNREC - Brownfield Preliminary Assessment II for Commerce Street (June 1997)

Qualifiers:

- ND - compound was not detected
- Bold - concentration exceeds URS
- nca - no criteria available

PCB Mass Loading
American Scrap and Waste
SIRB ID: DE-1131
Wilmington, Delaware



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Site Photographs

**PCB Mass Loading Evaluation
American Scrap and Waste**



Northwest portion of the site with drainage ditch parallel to the road.



East portion of the property with a cover consisting of bare ground.



**PCB Mass Loading Evaluation
American Scrap and Waste**



Catch basin where sediments from overland flow are transported from east portion of the property.



Minimal vegetation cover on perimeter of west portion of property.

PCB Mass Loading
American Scrap and Waste
SIRB ID: DE-1131
Wilmington, Delaware



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Overland Flow Calculations

**PCB Loading Calculations from the Universal Soil Loss Equation
 American Scrap and Waste (Area 1)
 Wilmington, DE
 DE-1131**

Surface PCB Concentration 3.25 mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	170	10 ² ft-ton in/acre hr
K	Soil Erodibility	0.15	0.01 ton acre hr/ac ft-ton in
	Estimated Slope Length	634	Feet
	Estimated Elevation Difference	1.9	Feet
	Slope	0.3	Percent (ft/ft)
	Erodeable Area	1.22	Acres
LS	Topographic Factor	0.068	Dimensionless
C	Cover and Management Factor	0.52	Dimensionless
P	Support Practice Factor	1	Dimensionless
	Average Annual Soil Loss	0.52	ton/ac/yr

PCB Loading via Overland Flow 1.9 grams/year - PCBs

American Scrap and Waste Overland Flow Calculations (Area 1)

Location: USA\Delaware\New Castle County

Net C factor: 0.45
 Net LS factor: 0.068
 Net K factor: 0.15
 Net contour factor: 1.0
 Net ridge factor: 1.0
 Net ponding factor: 0.67

Rock cover, %: 0
 Adjust rock cover: open
 General yield level: Set by user
 Surf. res. cov. values: Surf. cover
 Adjust res. burial level: Normal res. burial

Soil conditioning index: open

Manage Soil Topo

Energy use for entire simulation, BTU/ac: 0

Energy use for entire simulation, gal/ac: 0
 Fuel cost for entire simulation, US\$/ac: 0

Fuel type for entire run: (none)

Avg. slope steepness, %: 0.30
 Detachment on slope, t/ac/yr: 0.52
 Sediment delivery, t/ac/yr: 0.52

Slope length (horiz), ft: 640
 Soil loss erod. portion, t/ac/yr: 0.52
 Soil loss for cons. plan, t/ac/yr: 0.521
 T value, t/ac/yr: 3.0

Crit. slope length, ft: []

Align of oper on segments | General composite segment info | Biomass by layer | Biomass summary | C subfactor by day | C subfactor by period | C subfactor by operation
 Ridges_contour by day | Erosion by day | Erosion by period | Erosion by operation | Erosion by year | Extra C, L, crit. length values | Hydrology | Management output by day
 Management output by period | Residue values | Roughness | STRIPS_AND_BARRIERS | MANAGEMENT_STRIP_BUILDER | Runoff / Sediment overall results
 Runoff / Sediment results by day | Sediment results by flow path | Sediment by segment | Strips / Barriers | Irrigation / Subsurface drainage | Diversion/terrace, sediment basin

Soil: MISC_CALCULATIONS1 | Topography | Management | Strips / Barriers | Irrigation / Subsurface drainage | Diversion/terrace, sediment basin

Slope Soils

Segment	Soil	Seg length (horiz), ft	Soil loss, t/ac/yr	Sed. del., t/ac/yr	Consolidation time, yr
+	Generic Soils\sand	640	0.52	0.52	7

**PCB Loading Calculations from the Universal Soil Loss Equation
American Scrap and Waste (Area 2)
Wilmington, DE
DE-1131**

Surface PCB Concentration 180 mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	170	10 ² ft-tonf in/acre hr
K	Soil Erodibility	0.15	0.01 tonf acre hr/ac ft-ton in
	Estimated Slope Length	245	Feet
	Estimated Elevation Difference	2.4	Feet
	Slope	1.0	Percent
	Erodeable Area	1.96	Acres
LS	Topographic Factor	0.160	Dimensionless
C	Cover and Management Factor	0.45	Dimensionless
P	Support Practice Factor	1	Dimensionless
	Average Annual Soil Loss	1.60	ton/ac/yr

PCB Loading via Overland Flow 512 **grams/year - PCBs**

American Scrap and Waste Overland Flow Calculations (Area 2)

Location: USA\Delaware\New Castle County

Net C factor: 0.45
 Net LS factor: 0.16
 Net K factor: 0.15
 Net contour factor: 1.0
 Net ridge factor: 1.0
 Net ponding factor: 0.88

Rock cover, %: 0
 Adjust rock cover: open
 General yield level: Set by user
 Surf. res. cov. values: Surf. cover
 Adjust res. burial level: Normal res. burial

Soil conditioning index: open

Energy use for entire simulation, BTU/ac: 0

Energy use for entire simulation, gal/ac: 0
 Fuel cost for entire simulation, US\$/ac: 0

Manage Soil Topo

Avg. slope steepness, %: 1.0
 Detachment on slope, t/ac/yr: 1.6
 Sediment delivery, t/ac/yr: 1.6

Slope length (horiz), ft: 250
 Crit. slope length, ft: 1.6
 Soil loss erod. portion, t/ac/yr: 1.59
 T value, t/ac/yr: 3.0

Fuel type for entire run: (none)

Align of oper on segments | General composite segment info | Biomass by layer | Biomass summary | C subfactor by day | C subfactor by period | C subfactor by operation
 Ridges_contour by day | Erosion by day | Erosion by period | Erosion by operation | Erosion by year | Extra C, L, crit. length values | Hydrology | Management output by day
 Management output by period | Residue values | Roughness | STRIPS_AND_BARRIERS | MANAGEMENT_STRIP_BUILDER | Runoff / Sediment overall results
 Runoff / Sediment results by day | Sediment results by flow path | Sediment by segment | Sediment by segment by day | Soil output by day | Yield values | Visuals | Info
Soil | MISC_CALCULATIONS1 | Topography | Management | Strips / Barriers | Irrigation / Subsurface drainage | Diversion/terrace, sediment basin

Segment: 1
 Soil: Generic Soils\sand
 Seg length (horiz), ft: 250
 Soil loss, t/ac/yr: 1.6
 Sed. del., t/ac/yr: 1.6
 Consolidation time, yr: 7

PCB Mass Loading
American Scrap and Waste
SIRB ID: DE-1131
Wilmington, Delaware



BrightFields, Inc.

Groundwater Transport Calculations

**PCB Loading Calculations - Groundwater Discharge to Surface Water
American Scrap and Waste
Wilmington, DE
DE-1131**

**TABLE A
Groundwater Discharge Calculations**

Location	Hydraulic Conductivity (K) (ft/day)	Horizontal Gradient (i) (ft/ft)	Cross-sectional Area (A) (ft ²)	Groundwater Discharge*	
				Liters/day	Gallons/day
TP11-TP13					
Minimum	14.2	0.010	608	2,400	650
Maximum	43	0.010	1,600	19,000	5,100

* - Groundwater Discharge (Q) = KiA

**TABLE B
Potential Groundwater PCB Concentration Calculation**

Location	Maximum Soil PCB (µg/kg)	f _{oc} (fraction of organic carbon)		Pore Water PCB (µg/L)	
				Minimum	Maximum
TP11-TP13	2,500	0.01	0.05	0.55	2.74

**TABLE C
Estimated Mass Loadings of PCBs in Groundwater to Surface Water**

Location	Subsurface Soil Concentration/ Converted to Pore Water Concentration (µg/L)	Estimated PCB Mass Loading (g/yr)	
		Minimum	Maximum
TP11-TP13	2.74	2.45	19.3