BrightFields, Inc.

Appendix 26

REICHHOLD CHEMICAL

DOVER, DELAWARE

SIRS ID: DE-0245

GENERAL SITE INFORMATION

Site Name: Reichhold Chemical

SIRS ID Number: DE-0245

Site Location and Description:

The Reichhold Chemical site is located at 144 Fork Branch Road in Cheswold, Delaware (Figure 1). The site is approximately 101 acres in size and is comprised of eight tax parcels (ED00-057.01-01-09.00, ED00-057.00-01-10.00, ED00-057.00-01-11.00, ED00-057.00-01-12.00, ED00-057.00-01-13.00, ED00-057.00-01-14.00, ED00-057.01-01-15.00, and ED00-057.01-01-16.00) located just north of the Dover city limits.

The property is bounded to the north by Fork Branch Road, to the east by industrial properties, beyond which are residences, to the south by wooded area, and to the west by railroad tracks and Fork Branch, a tributary which flows into Silver Lake and eventually the St. Jones River and Delaware Bay. There is a National Pollution Discharge Elimination System (NPDES) outfall at the facility and many small streams and drainage ditches in the vicinity of the Site, which all discharge into Fork Branch. Overall, surface water is expected to flow south towards Fork Branch, less than 100 feet from the southern site boundary.

Decommissioning of the site, including the demolition of many of the structures, was finished in June 2011. Today the only remaining structures on the site are the warehouse, guardhouse, and locker room. The property is now owned by Reichhold, Inc., who intends to sell the property for redevelopment of certain areas.

Previous Site Uses:

Starting in 1957, the site was utilized for the production of Styrene Butadiene (SB) polymers to be used as an elastic material. Later both SB and Polyvinyl Acetate Emulsion (PVA) were manufactured for the paper, paint, adhesives, textiles, and building products industries.

Reichhold, Inc. occupied the site from 1976 through 2002. In 2002, The Dow Chemical Company and DowReichhold Specialty Latex, LLC (DRSL), took ownership of the facility until it was closed in 2009. The facility took up about 32 out of the 110 acres. The area is bordered to the east

by an open field and to the south by drainage ditches and marshy areas. In 2010, DRSL contracted Reichhold to decommission and demolish the facility in preparation for redevelopment.

Site Regulatory Status:

This section briefly summarizes previous investigations performed on the site through the SIRS program. A current SIRS regulatory status is also included.

Chronology of Investigations and Regulatory Actions

Investigation or Regulatory Action	Date	Description
Groundwater Sampling (Ecology & Environment)	1980-1981	Under contract to the EPA, the Field Investigation Team (FIT) collected groundwater samples in 1980 from within the site as well as domestic wells outside of the site. DEHP and di-n-octylphthalate were detected. Additional FIT testing was performed in 1981and samples had detectable levels of phenol in Well #34 and TCE, DCE, and TCA in Well #33. The reports were not available at the time of this report but they were mentioned in the 1996 Facility Evaluation.
Resampling Report of Reichhold/Cokers (NUS Corporation)	1983	This document was not available at the time of this report but it was mentioned in the 1990 Preliminary Assessment. NUS Corporation reported unpermitted disposal of latex process sludge in an unlined pit between 1957 and 1964. The waste was later excavated and the plant's biological wastewater treatment system was built on top of the area. The existence and excavation of the unlined pit were denied by Reichhold Company officials during the 1990 DNREC Multi-Media Inspection.
Site Investigation (Halliburton NUS)	1984	The Site Investigation (SI) revealed high TCE concentrations in Well #33 as well as traces of TCA, DCE, PCE, and total xylenes. The SI was discussed in the 1996 Facility Evaluation.
Multi-Media Inspection (DNREC)	1990	The report includes details about the plant and its operating history as well as the different permits for the site, including air, water, and solid waste.
Preliminary Assessment (DNREC)	1990	Drums on concrete pads for waste collection were identified on the site but the drums were intact and stored for less than 90 days. The four wells on-site were sampled and analysis revealed high organic chemical concentrations in the samples from Building 406 and well #33 including 1,1,1-Trichloroethane (TCA) at 3.5 µg/L, Trichloroethylene (TCE) at 0.9 µg/L, Tetrachloroethylene (PCE) at 0.8 µg/L and 7.4 µg/L, Freon at 1.0 µg/L and 28 µg/L, and 1,1 Dichloroethylene

Investigation or Regulatory Action	Date	Description
Preliminary Assessment (DNREC)	1990	(DCE) at 0.4 µg/L and 3.8 µg/L. There was no evidence of past accidents or spills on-site during the assessment. Liquid wastes were treated on-site at the treatment plant, solid wastes were transported to the Kent County Landfill, and hazardous wastes are manifested and disposed of off-site.
Draft Site Inspection (DNREC)	1992	There had been seven complaints since January 1991 about the odors coming from the property. Ambient air monitoring showed that the odor was not health related and was just an aesthetic issue. A total of 21 samples, 12 aqueous (groundwater and surface water) and nine solid (soil and sediment), were collected in June 1991. PCBs (Aroclor 1260) were detected in soil and sediment samples with a concentration of 650 µg/kg at soil sample location RCI-20 and 65 µg/kg at the midstream sediment location. The EPA PCB action level range for soil in industrial areas is 10,000-25,000 µg/kg. However, the SI stated that PCBs accumulating in fish in Fork Branch would affect fishing in the whole St. Jones River drainage system.
Facility Evaluation (DNREC)	1996	Samples were collected consisting of sediment and surface water from on-site drainage ditches, sediments and surface water from Fork Branch, and on-site soils and groundwater. Soil and sediment samples were screened for PCBs then selected soil samples and all sediment samples were submitted for laboratory analysis. In most of the samples, PCBs were either not detected or not analyzed for.
Remedial Investigation (CH2M HILL)	1999	Soil, groundwater, sediment, and surface water samples were collected during the investigation. Soil and groundwater samples were not analyzed for PCBs. Surface water and sediment samples were collected in three different phases and most of the samples were analyzed for PCBs with the exception of Phase I surface water samples. During Phase I, samples were collected from onsite drainage ditches and marshes. PCBs were detected in three sediment samples above the HSCA sediment screening level. In Phase II, samples were collected along the drainage ditch that diverts surface water from the facility as well as the locations from Phase I. PCBs were detected in four sediment samples above the screening level with the highest concentration in RCWE-10 from the marshy area. During Phase III,

Investigation or Regulatory Action	Date	Description
Remedial Investigation (CH2M HILL)	1999	sediment samples were taken from Fork Branch and PCBs were detected above the screening level at one location.
Final Inspection Report (CH2M HILL)	2001	The Final Inspection Report was not available for review but the remediation was described in the Ten-Year Remedy Review Report. Remedial actions were performed to reduce concentrations and/or exposure in the southwest corner of the facility next to the Flare Stack, the marsh area nearby, and the drainage ditches to Fork Branch. New drainage facilities were installed and the existing drainage ditch was backfilled. A fence was also installed around the Marsh Area. In 2002, the site was issues a Certificate of Completed Remedy (COCR). A deed restriction was placed on the site and natural attenuation monitoring was performed for the Marsh Area. The 2012 Ten-Year Remedy Review Report indicated that the ditch covers were not eroding but the security deed restriction should remain in place to prevent human exposure.
Final Inspection Report for Marsh Area Restoration (CH2M HILL)	2005	The report summarized the completed remediation performed in the Marsh Area, a freshwater non-tidal wetland south of the manufacturing facility on the site. The area was contaminated with mercury and arsenic. In an effort to minimize ecological exposure, the area was covered in six inches of clean top soil and seeded. The Five Year Remedy Review Report as well as the 2012 Ten-Year Report for the ditch remediation determined that the remediation effectively stabilized erosion in the Marsh Area and allowed vegetation to cover the area. The Ten-Year Report stated that the O&M Plan objectives had been achieved but Reichhold, Inc. would remain responsible for maintaining the remedy and submitting reports every five years to ensure that the conditions do not change.
Phase II Environmental Site Assessment (CH2M HILL)	2011	The property was split into 13 potential areas of concern (PAOCs). In 2009, a geophysical survey was performed at the site prior to taking samples due to the density of buried infrastructure. Samples were collected from 36 soil locations, four sediment locations, 17 temporary monitoring well locations, eight monitoring wells, and six production wells. The samples were analyzed for VOCs and SVOCs, but not PCBs. Due to poor map quality, some sample locations could not be added to the

Investigation or Regulatory Action	Date	Description
Phase II Environmental Site Assessment (CH2M HILL)	2011	database. In addition, soil boring logs were unavailable and therefore saturation of soil samples was inferred based on available depth to groundwater data from other investigations.
TSCA Soil Remediation Report (CH2M HILL)	2011	In June 2006, the EPA prepared a TSCA PCB 6(e) compliance evaluation report. Transformers containing PCBs had been stored at the facility in Buildings 409, 423, 424, 430, and 440. Oil wipe samples were collected from the floor beneath the transformers in Building 423 and metal ledges on the transformers in Buildings 423 and 440. Aroclor 1260 was detected at concentrations ranging from 44.8 ppm to 1,600 ppm. As a part of the 2011 TSCA Soil Remediation Report, concrete samples were collected from all five buildings that had held transformers (Buildings 409, 423, 424, 430, and 440). After analysis, some of the concrete floor slabs were disposed of and soil samples were collected from beneath the previous slabs in Buildings 409, 423, 430, and 440. Overall PCB concentration exceeded TSCA high-occupancy area screening levels in concrete floor slabs from Buildings 409 and 440 and soil beneath Buildings 409, 430, and 440. To remediate the concrete, concrete floor slabs were removed from Buildings 409, 423, 430, and 440 and then disposed of. 268,288 kg of soil was excavated from beneath the former slabs at Buildings 409, 430, and 440 and disposed of off-site.
Groundwater Sampling (CH2M HILL)	2012	Monitoring well MW-11 was sampled for butyl acrylate, ethyl acrylate, and methyl acrylate in response to high concentrations detected during the Phase II Environmental Site Assessment. Analysis showed that butyl acrylate concentrations declined drastically downgradient of the aboveground storage tank, the source of the buytl acrylate. Overall, it was not migrating beyond site boundaries and did not pose a significant risk to human health or the environment.

Current Regulatory Status:

In 2011, a Groundwater Management Zone (GMZ) was established to restrict groundwater usage. A letter from DNREC in May 2013 in response to the 2012 Groundwater Monitoring Sampling Data stated that the GMZ should remain in place even though butyl acrylate does not seem to pose

an adverse risk. It also stated that additional groundwater sampling should be conducted every five years until butyl acrylate concentrations are at or below 40 µg/L (at that point, the GMZ may be lifted) and that the operation and maintenance plan must be implemented.

In April 2014, CH2MHill submitted a draft RI Report for the site to DNREC-SIRS.

SUMMARY OF SITE PCB INFORMATION

Site Investigation PCB Findings:

For purposes of the PCB loading estimates, surface soil is defined as 0 to 2 feet below ground surface (bgs). Samples collected from soil depths spanning 2 feet bgs were included in both the surface and subsurface data sets.

PCBs were detected in 42 surface soil samples with concentrations ranging from 0.041 mg/kg to 84 mg/kg. PCBs were detected in 21 unsaturated subsurface soil samples with concentrations ranging from 0.036 mg/kg to 80 mg/kg. In saturated subsurface soil samples, PCBs were detected at one location, DP-14D (0 to <18 feet below ground surface (bgs)), at a concentration of 0.49 mg/kg.

The calculated 95% upper confidence limit (UCL) of the mean of the concentration of total PCBs observed in the surface soil (for overland flow calculations) is 0.41 mg/kg. PCBs were not detected in groundwater samples.

Concentrations of PCBs on Site			
Sample Matrix	**Corresponding Figure**	**Analytical Methods**	**Range of Total PCBs**
Surface Soil	Figure 2	Method 8082 and Screening Data	Not detected to 84 mg/kg
Subsurface Soil (unsaturated)	Figure 3	Method 8082 and Screening Data	Not detected to 80 mg/kg
Subsurface Soil (saturated)	Figure 4	Screening Data	Not detected to 0.49 mg/kg
Groundwater	Figure 5	Method 8082	Not Detected

A summary of all samples collected for PCB analyses are presented in Tables 1 through 3.

Acreage where PCBs detected:

The estimated surface soil area impacted by PCBs is 9.3 acres (Figure 2). The estimated subsurface unsaturated soil area impacted by PCBs is 9.6 acres (Figure 3). The estimated subsurface saturated soil area impacted by PCBs is 5.4 acres (Figure 4). Based on the data reviewed and analyzed by BrightFields, the groundwater is not impacted by PCBs.

PCB Remediation Status:

In 2011, concrete and soil containing PCBs above TSCA screening levels were removed from Building 409, 423, 430, and 440. Confirmatory samples showed that PCB concentrations had been reduced to below the TSCA high-occupancy area screening levels for bulk remediation wastes of 1 mg/kg.

PCB MASS LOADING SUMMARY

The PCB mass loading rate to surface water via overland flow and groundwater transport was estimated for the Reichhold Chemical 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. A breakdown of the individual factors is presented below with a brief explanation of their choice.

Ground Cover and Canopy:

The surface cover and flow paths were assessed through aerial photography and available contour mapping (Delaware Data Mil, 2007). The cover/management factors (C) assigned to the erodible area and associated flow paths was 0.013, which corresponds to areas instituting a vegetative cover of grass or grass like plants over greater than 80% of the area.

Site Sediment and Erosion Control Practices:

Based on the aerial photography evaluation and review of site documents it does not appear that any sediment and erosion control practices are being implemented on Site.

Input Factors and Results:

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

Reichhold Chemical

RUSLE Factors	Values Provided	Explanation of choice
R = rainfall-runoff erosivity index (10^2 ft-tonf-in/ac-hr-yr)	175	An appropriate value for R for the Site was determined using the Isoerodent Map of the Eastern U.S. from the Stormwater Phase II Final Rule Construction Rainfall Erosivity Waiver (USEPA, 2012).
K = soil erodibility (0.01 ton-ac-hr/ ac-ft-tonf-in)	0.24	The soil erodibility factor was selected from the National Resource Conservation Soil Survey Geographic Database (SSURGO).
ls = topographic factor (dimensionless)	0.18	The topographic factor was derived based on the slope and flow accumulation grids created in ArcGIS. An output LS grid was created and the average value for the grid is provided.
C = cover/management factor (dimensionless)	0.013	The cover/management factor C assigned to the erodible area was 0.013, which corresponds to areas instituting a vegetative cover of grass or grass like plants over greater than 80% of the area.
P = support practice factor (dimensionless)	1	No documentation was provided indicating that any sediment and erosion controls are in place.
A = average annual soil loss estimate (ton/ac-yr)	0.15	The average soil loss estimate was generated by ArcGIS using the input factors listed above.
Erodible Area (acres)	3.3	The erodible area was calculated based on the pervious surfaces within the area of concern polygon for surface soil (Figure 6).

For factors that were not consistent across the site, rasters were used to characterize the variations. Due to the methodology utilized to derive the soil loss estimate, the numbers listed above cannot simply be multiplied.

The total estimated PCB loading via overland flow for the Reichhold Chemical Property is **0.18 grams per year**. Please see attached table for specific variables.

Uncertainty Analysis Associated with Overland Flow:

Specific Areas and Degree of Uncertainty for Reichhold Chemical

	Samples Per Acre (site)	Chemical Data Quality*	Soil Type	Site Coverage	Map Quality	Average Distance to Discharge Point
Site Specific Information	1.4	Aroclor Data; Screening Data	Logs	Based on aerial	Adequately Scaled Maps; Poorly Scaled Maps	Approximately 1,980 feet
Degree of Uncertainty	Moderate to High	Moderate to High	Moderate	High	Moderate	High

* Primary analysis used in the historical samples

Sources of uncertainty for the Reichhold Chemical site include: The data utilized in the analysis was primarily Aroclor lab data and some Immunoassay screening data. The site was fenced, preventing a site assessment to evaluate the site coverage. The sample locations were from adequately scaled maps and poorly scaled maps. Based on this evaluation the level of uncertainty associated with overland flow PCB mass loading from the Reichhold Chemical site is **Moderate to High.**

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. A groundwater discharge map is included as Figure 7.

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 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)	18.7	18.7	CH2M Hill performed slug tests on the Columbia Aquifer well. The hydraulic conductivity values ranged from 0.09 to 146 ft/day (Cooper Method). CH2M Hill used the geometric mean of 18.7 ft/day in their calculations.
I = Horizontal Groundwater Gradient	0.0066	0.0096	Gradients calculated by CH2M Hill.
Saturated Thickness (ft)	22	35	CH2M Hill lists the aquifer thickness as ranging from 22 to 35 feet. Flow is toward the southwest, toward Fork Branch
Lateral Discharge Distance (ft)	370	370	The lateral discharge distance was estimated to be equal to the width of the PCB impacted area measured perpendicular to the flow.
A= Cross-Sectional Area (ft2)	3,700	3,700	Calculated from the saturated thickness and lateral discharge distance.
Groundwater PCB Concentration (µg/L)	0.11	0.54	The maximum concentration observed in the saturated subsurface soil (0.490 mg/kg) was used to determine the estimated concentration in groundwater.
Distance to Discharge point (ft)	Less than 100 ft		Approximate distance from property boundary to closest surface water location.

Mass Loading Via Groundwater Transport Result:

Using the data from CH2M Hill, the groundwater discharge is between 12,900 and 19,000 L/day (see attached Table A). The analysis uses the geometric mean flow rate from CH2M Hill per day.

The maximum detected PCB concentration in saturated soil (0.49 mg/kg) was used to calculate the groundwater concentrations for the loading estimate. This calculation yielded a pore water PCB range of 0.11 to 0.54 µg/L (Table B).

The estimated minimum and maximum contaminant mass loading contributions shown in Table C assume that there are no contaminant losses due to degradation, dispersion, sorption, volatilization, etc.

The total PCB loading via groundwater discharge is estimated to be between **2.5** and **4.0 grams per year** (Table C). It is unlikely that the whole saturated zone is contaminated with PCBs and therefore, the PCB loading is probably a fraction of this amount.

Uncertainty Analysis Associated with Groundwater Transport:

Specific Areas and Degree of Uncertainty for Reichhold Chemical

	Groundwater PCB Concentration	**Sampling Density**	**Hydraulic Conductivity**	**Horizontal Groundwater Gradient**	**Saturated Thickness**	**Lateral Discharge Distance**	**Distance to Discharge Point**
Site Specific Information	Partitioning based on maximum concentration observed in saturated soil	0.07; Possible data gaps	Based on detailed aquifer testing	Multiple points with numerous groundwater measurements	Saturated thickness is listed in the CH2M Hill document. The uncertainty is the thickness of PCB contamination.	Good groundwater gradient defined and a moderate number of samples collected on-site	Less than 100 ft
Degree of Uncertainty	High	High	Low	Low	Moderate	Low	Low

Based on this evaluation the level of uncertainty associated with groundwater transport PCB mass loading from the Reichhold Chemical site is **Low to Moderate.**

Site References:

CH2M HILL, Inc., 1999, Reichhold Inc., Cheswold, Delaware Site, Remedial Investigation (RI) Report, January 1999.

CH2M HILL, Inc., 2005, Final Inspection Report, Marsh Area Restoration, Dow Reichhold Specialty Latex LLC, September 2005.

CH2M HILL, Inc., 2010, Five Year Remedy Review Report, Marsh Area Remediation, Former Dow Reichhold Specialty Latex LLC Facility, July 2010.

CH2M HILL, Inc., 2011, Phase II Environmental Site Assessment Report, Dow Reichhold Specialty Latex LLC Facility, January 2011.

CH2M HILL, Inc., 2012, Data from March 2012 Groundwater Sampling at the Former Reichhold, Inc. Facility located in Cheswold, Delaware, August 2012.

CH2M HILL, Inc., 2012, 10-Year Remedy Review Report, HSCA Remediation, Former Dow Reichhold Specialty Latex LLC Facility, September 2012.

CH2M HILL, Inc., 2011, TSCA Soil Remediation Report, Former Reichhold Facility, October 2011.

Department of Natural Resources and Environmental Control (DNREC), 1990, Multi-Media Inspection, April 1990.

DNREC, 1990, A Preliminary Assessment of Reichhold Chemical, Inc., July 1990.

DNREC 1992, Draft Site Inspection of Reichhold Chemical, Inc., October 1992.

DNREC 1996, Reichhold Chemical Facility Evaluation, Findings of Fact, June 1996.

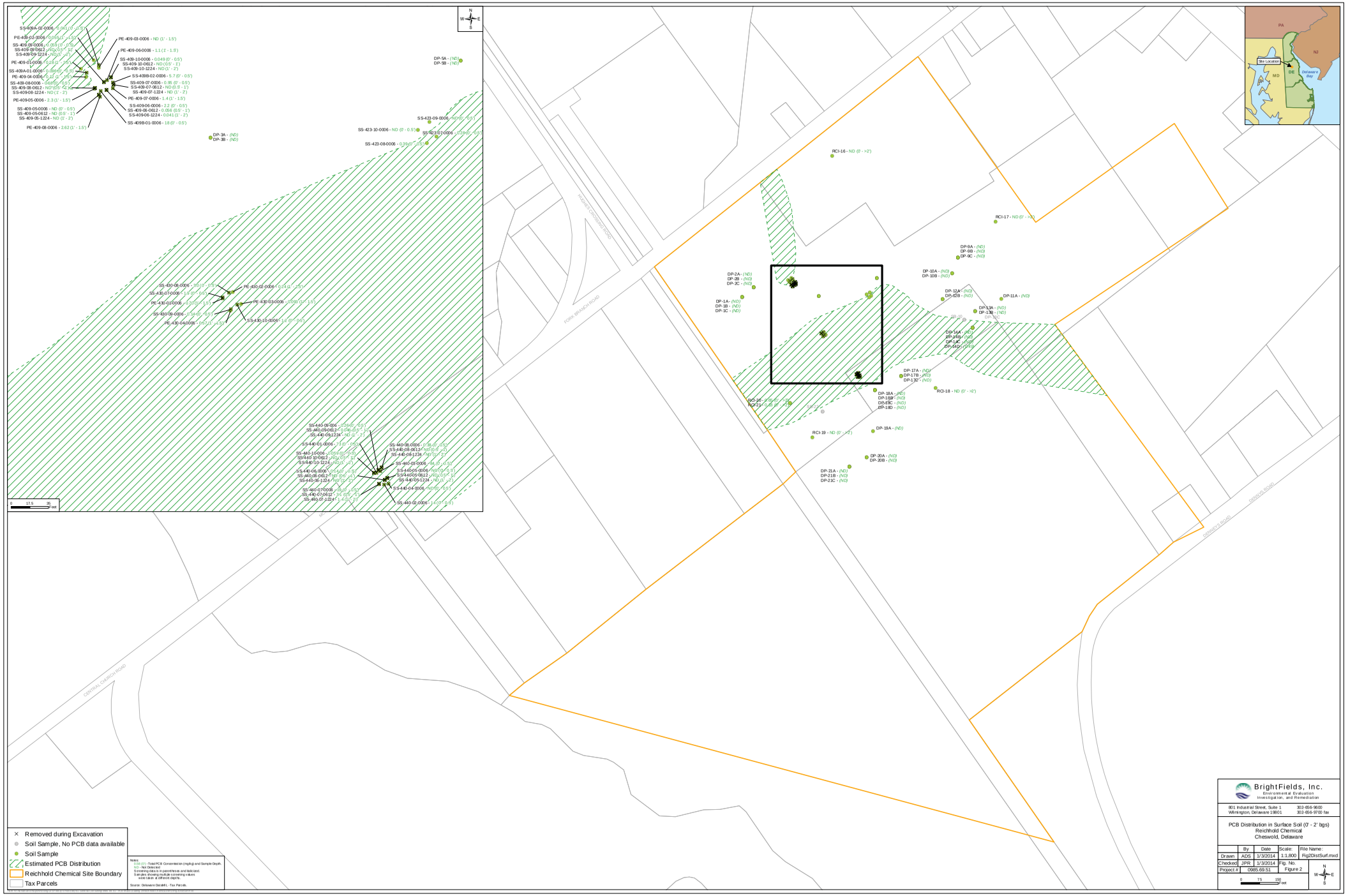
Delaware Geological Survey, 2013, Delaware Data Mil, <http://datamil.delaware.gov/geonetwork/srv/en/main.home>, May 2013.

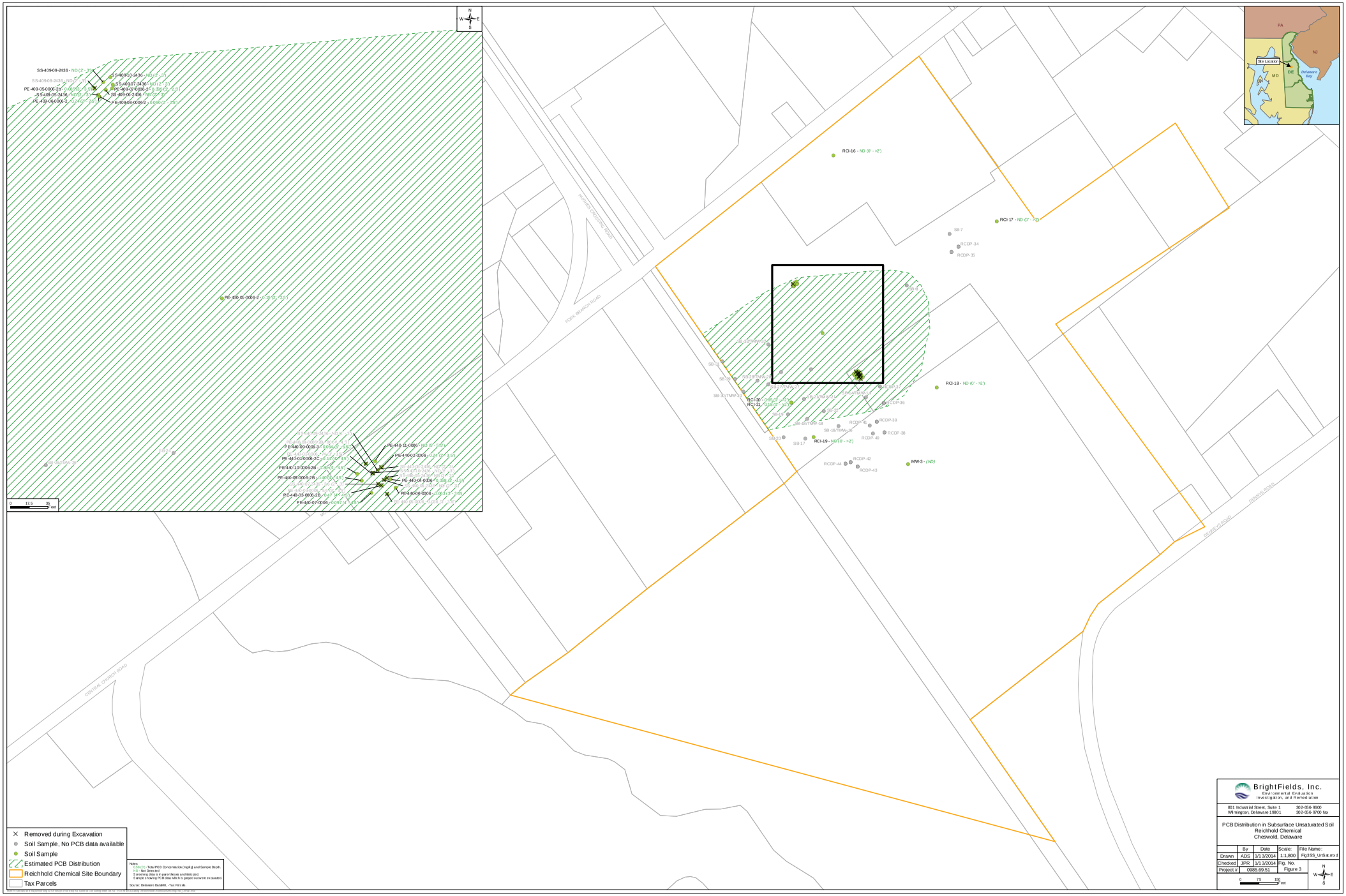
New Castle County, 2013, New Castle County Parcel Search, <http://www3.nccde.org/parcel/search/>, July 2013.

Phillips Lytle LLP to DNREC, 10 Year Remedial Evaluation Report and Groundwater Data Reichhold Chemical Site (DE-0245), May 2013.

Figures

Soil Sample
Groundwater Sample
Surface Water Sample
Sediment Sample
Other
Reichhold Chemical Site Boundary (100.84 acres)
Tax Parcels
Source: Delaware DataMIL - Aerial 2012, Tax Parcels.
Fork Branch
Merrick Southern Railroad
Site Location
PA
NJ
MD
DE
Delaware Bay
BrightFields, Inc.
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 (2012)
Reichhold Chemical
Cheswold, Delaware
By
Date
Scale:
File Name:
Drawn
ADS
4/23/2014
1:2,400
Fig1SiteLoc.mxd
Checked
JPR
4/23/2014
Fig. No.
Project #
0985.69.51
Figure 1
0
100
200
Feet


PE-409-03-0006 - ND (1' - 1.5')
PE-409-06-0006 - 1.1 (1' - 1.5')
SS-409-10-0006 - 0.049 (0' - 0.5')
SS-409-10-0612 - ND (0.5' - 1')
SS-409-10-1224 - ND (1' - 2')
SS-409B-02-0006 - 5.7 (0' - 0.5')
SS-409-07-0006 - 0.95 (0' - 0.5')
SS-409-07-0612 - ND (0.5' - 1')
SS-409-07-1224 - ND (1' - 2')
PE-409-07-0006 - 1.4 (1' - 1.5')
SS-409-06-0006 - 2.2 (0' - 0.5')
SS-409-06-0612 - 0.056 (0.5' - 1')
SS-409-06-1224 - 0.041 (1' - 2')
SS-409B-01-0006 - 18 (0' - 0.5')
PE-409-01-0006 - 0.18 (1' - 1.5')
SS-409A-01-0006 - 0.06 (0' - 0.5')
PE-409-04-0006 - 0.22 (1' - 1.5')
SS-409-08-0006 - 0.09 (0' - 0.5')
SS-409-08-0612 - ND (0.5' - 1')
SS-409-08-1224 - ND (1' - 2')
PE-409-05-0006 - 2.3 (1' - 1.5')
SS-409-05-0006 - ND (0' - 0.5')
SS-409-05-0612 - ND (0.5' - 1')
SS-409-05-1224 - ND (1' - 2')
PE-409-08-0006 - 2.62 (1' - 1.5')
DP-5A - (ND)
DP-5B - (ND)
DP-3A - (ND)
DP-3B - (ND)
SS-423-09-0006 - ND (0' - 0.5')
SS-423-10-0006 - ND (0' - 0.5')
SS-423-07-0006 - 0.28 (0' - 0.5')
SS-423-08-0006 - 0.39 (0' - 0.5')
SS-410-06-0006 - 0.10 (0' - 0.5')
SS-410-07-0006 - 0.1 (0' - 0.5')
PE-410-02-0006 - 0.14 (1' - 1.5')
PE-410-01-0006 - 0.12 (1' - 1.5')
PE-410-03-0006 - 0.08 (1' - 1.5')
SS-410-09-0006 - 0.34 (0' - 0.5')
PE-410-04-0006 - 0.67 (1' - 1.5')
SS-410-10-0006 - 1.1 (0' - 0.5')
SS-440-09-0006 - 0.39 (0' - 0.5')
SS-440-09-0612 - 0.58 (0.5' - 1')
SS-440-09-1224 - ND (1' - 2')
SS-440-01-0006 - 1.1 (0' - 0.5')
SS-440-10-0006 - 0.08 (0' - 0.5')
SS-440-10-0612 - ND (0.5' - 1')
SS-440-10-1224 - ND (1' - 2')
SS-440-06-0006 - 0.14 (0' - 0.5')
SS-440-06-0612 - ND (0.5' - 1')
SS-440-06-1224 - ND (1' - 2')
SS-440-07-0006 - 0.21 (0' - 0.5')
SS-440-07-0612 - ND (0.5' - 1')
SS-440-07-1224 - ND (1' - 2')
SS-440-08-0006 - 0.36 (0' - 0.5')
SS-440-08-0612 - ND (0.5' - 1')
SS-440-08-1224 - ND (1' - 2')
SS-440-01-0006 - 0.08 (0' - 0.5')
SS-440-05-0006 - ND (0' - 0.5')
SS-440-05-0612 - ND (0.5' - 1')
SS-440-05-1224 - ND (1' - 2')
SS-440-04-0006 - ND (0' - 0.5')
SS-440-02-0006 - 1.1 (0' - 0.5')
0 17.5 35 feet
N
W
E
S
RCI-16 - ND (0' - >2')
RCI-17 - ND (0' - >2')
DP-9A - (ND)
DP-9B - (ND)
DP-9C - (ND)
DP-2A - (ND)
DP-2B - (ND)
DP-2C - (ND)
DP-10A - (ND)
DP-10B - (ND)
DP-1A - (ND)
DP-1B - (ND)
DP-1C - (ND)
DP-12A - (ND)
DP-12B - (ND)
DP-11A - (ND)
DP-13A - (ND)
DP-13B - (ND)
DP-14A - (ND)
DP-14B - (ND)
DP-14C - (ND)
DP-14D - (ND)
DP-17A - (ND)
DP-17B - (ND)
DP-17C - (ND)
RCI-18 - ND (0' - >2')
DP-18A - (ND)
DP-18B - (ND)
DP-18C - (ND)
DP-18D - (ND)
RCI-20 - 0.08 (0' - 0.5')
RCI-21 - 0.46 (0' - 0.5')
RCI-19 - ND (0' - >2')
DP-19A - (ND)
DP-20A - (ND)
DP-20B - (ND)
DP-21A - (ND)
DP-21B - (ND)
DP-21C - (ND)
PA
NJ
MD
DE
Delaware Bay
Site Location
FORK BRANCH ROAD
CENTRAL CHURCH ROAD
DENNIS ROAD
Removed during Excavation
Soil Sample, No PCB data available
Soil Sample
Estimated PCB Distribution
Reichhold Chemical Site Boundary
Tax Parcels
Notes:
0.08 (0') - Total PCB Concentration (mg/kg) and Sample Depth.
ND - Not Detected
Screening data is in parentheses and italicized.
Samples showing multiple screening values were taken at different depths.
Source: Delaware DataBIL - Tax Parcels.
BrightFields, Inc.
Environmental Evaluation
Investigation, and Remediation
801 Industrial Street, Suite 1
Wilmington, Delaware 19801
302-656-9600
302-656-9700 fax
PCB Distribution in Surface Soil (0' - 2' bgs)
Reichhold Chemical
Cheswold, Delaware
Drawn: ADS
By: ADS
Date: 1/3/2014
Scale: 1:1,800
File Name: PlgDistSurf.mxd
Checked: JPR
Date: 1/3/2014
Fig. No.: Figure 2
Project #: 0985.69.51
0 75 150 feet
N
W
E
S



Removed during Excavation
Soil Sample, No PCB data available
Soil Sample
Estimated PCB Distribution
Reichhold Chemical Site Boundary
Tax Parcels

Notes:
0.00 (0') - Total PCB Concentration (mg/kg) and Sample Depth.
ND - Not Detected.
Screening data is in parentheses and italicized.
Samples showing PCB data which is (grayed out) were excavated.

Source: Delaware Data811, - Tax Parcels.

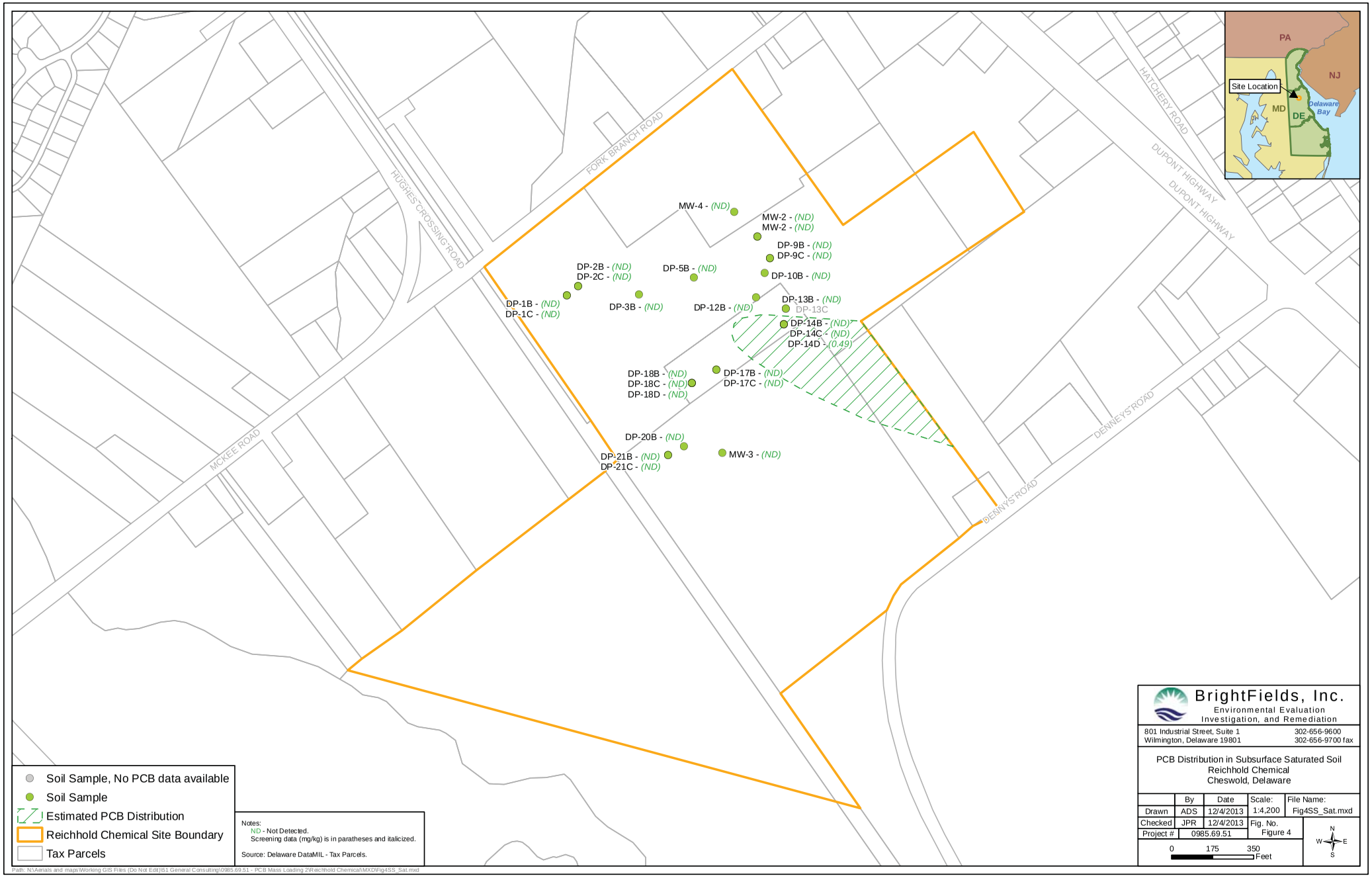
BrightFields, Inc.
Environmental Evaluation
Investigation, and Remediation

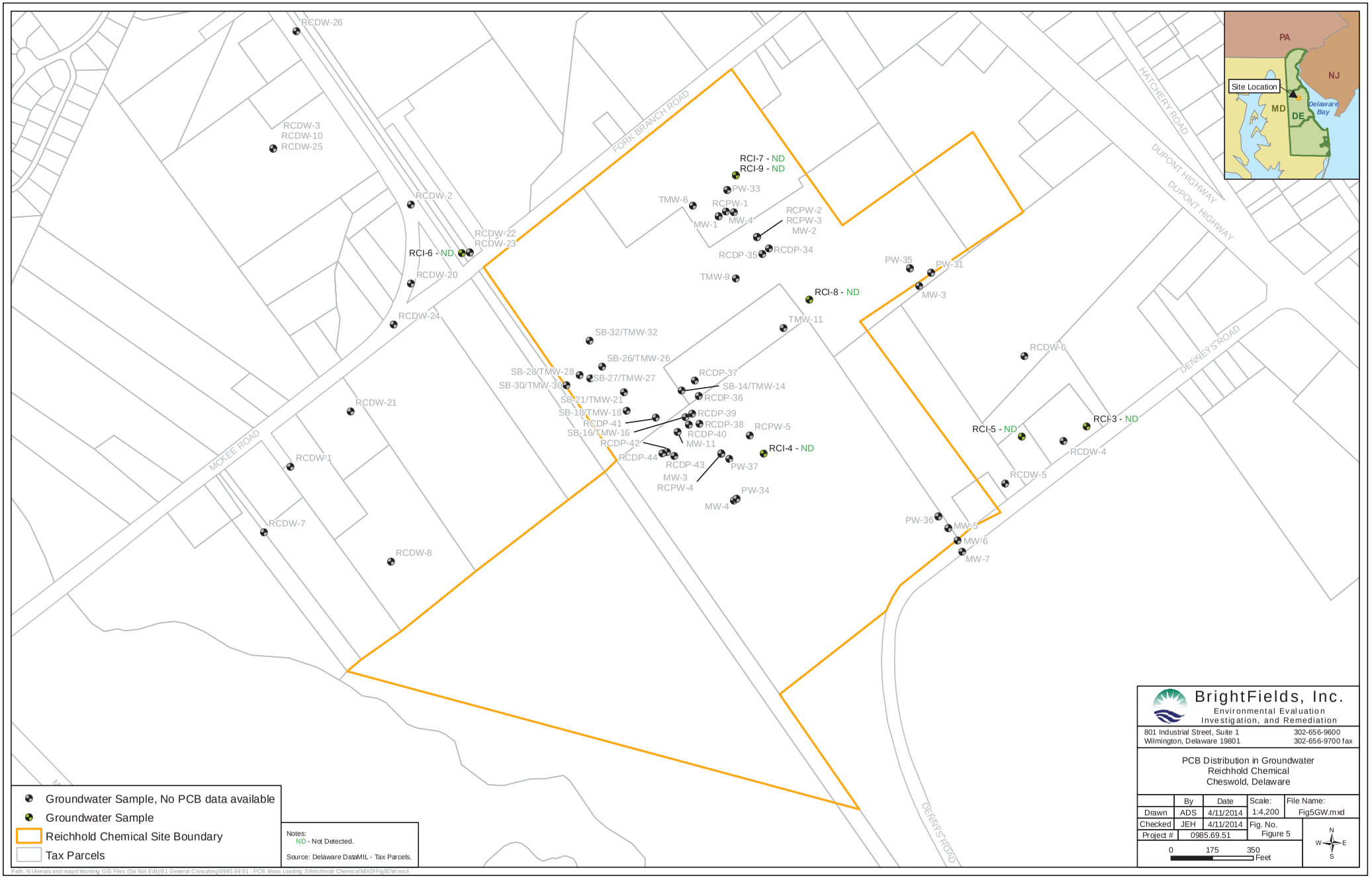
801 Industrial Street, Suite 1
Wilmington, Delaware 19801
302-656-9600
302-656-9700 fax

PCB Distribution in Subsurface Unsaturated Soil
Reichhold Chemical
Cheswold, Delaware

	By	Date	Scale:	File Name:
Drawn	ADS	1/13/2014	1:1,800	Pkg1935_UnSatur.mxd
Checked	JPR	1/13/2014	Fig. No.	
Project #	0985.69.51		Figure 3	

0 75 150 Feet
N
W
E
S


FORK BRANCH ROAD
HUGHES CROSSING ROAD
MCKEE ROAD
HATCHERY ROAD
DUPONT HIGHWAY
DUPONT HIGHWAY
DENNEY'S ROAD
DENNY'S ROAD
MW-4 - (ND)
MW-2 - (ND)
MW-2 - (ND)
DP-9B - (ND)
DP-9C - (ND)
DP-2B - (ND)
DP-2C - (ND)
DP-5B - (ND)
DP-10B - (ND)
DP-1B - (ND)
DP-1C - (ND)
DP-3B - (ND)
DP-12B - (ND)
DP-13B - (ND)
DP-13C
DP-14B - (ND)
DP-14C - (ND)
DP-14D - (0.49)
DP-18B - (ND)
DP-18C - (ND)
DP-18D - (ND)
DP-17B - (ND)
DP-17C - (ND)
DP-20B - (ND)
DP-21B - (ND)
DP-21C - (ND)
MW-3 - (ND)
PA
NJ
MD
DE
Delaware Bay
Site Location
Soil Sample, No PCB data available
Soil Sample
Estimated PCB Distribution
Reichhold Chemical Site Boundary
Tax Parcels
Notes:
ND - Not Detected.
Screening data (mg/kg) is in paratheses and italicized.
Source: Delaware DataMIL - Tax Parcels.
BrightFields, Inc.
Environmental Evaluation
Investigation, and Remediation
801 Industrial Street, Suite 1
Wilmington, Delaware 19801
302-656-9600
302-656-9700 fax
PCB Distribution in Subsurface Saturated Soil
Reichhold Chemical
Cheswold, Delaware
By
Date
Scale:
File Name:
Drawn
ADS
12/4/2013
1:4,200
Fig4SS_Sat.mxd
Checked
JPR
12/4/2013
Fig. No.
Project #
0985.69.51
Figure 4
0
175
350
Feet
N
W
E
S
Path: N:\Aerials and maps\Working GIS Files (Do Not Edit)\51 General Consulting\0985.69.51 - PCB Mass Loading 2\Reichhold Chemical\MXD\Fig4SS_Sat.mxd



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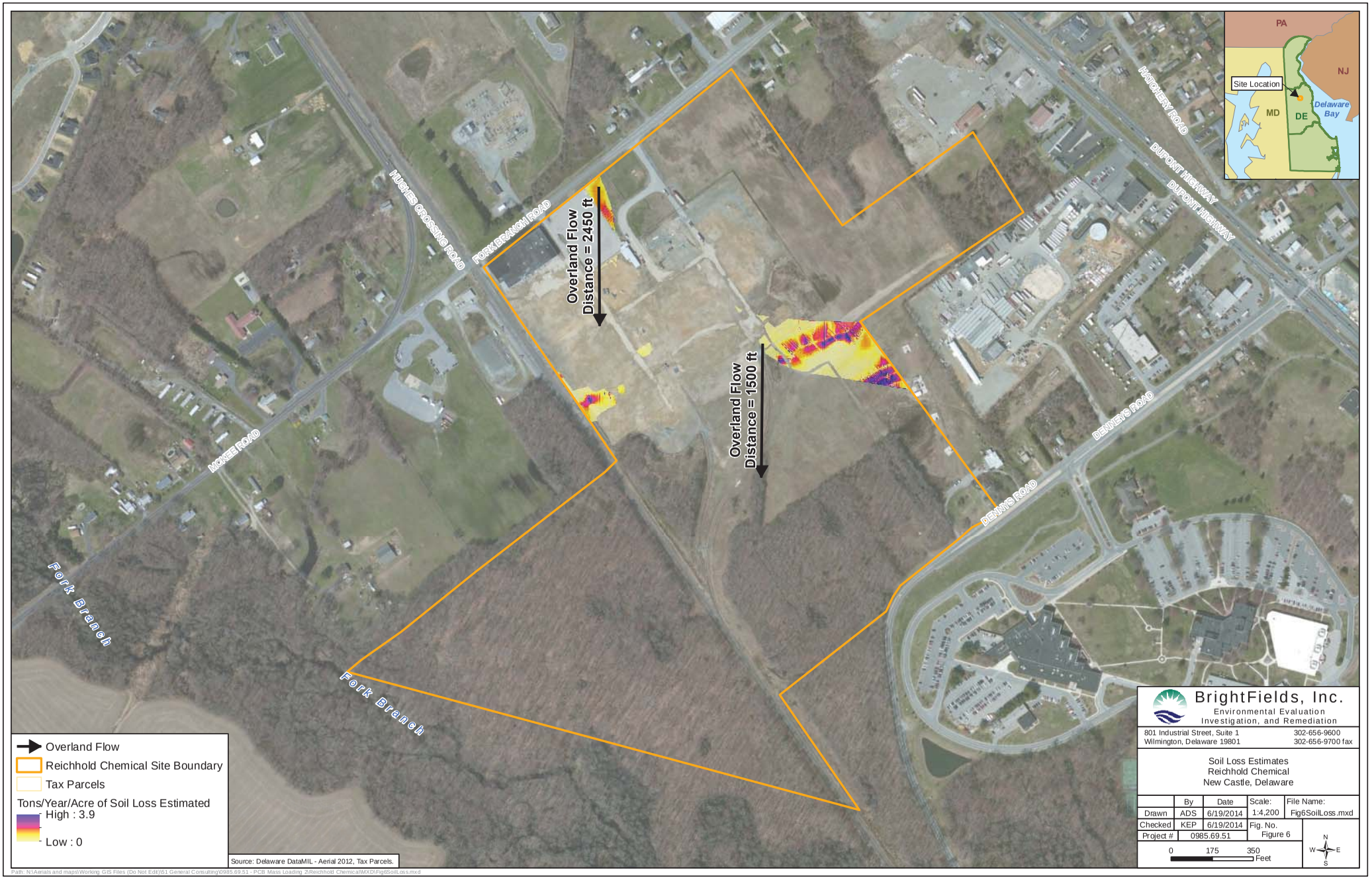

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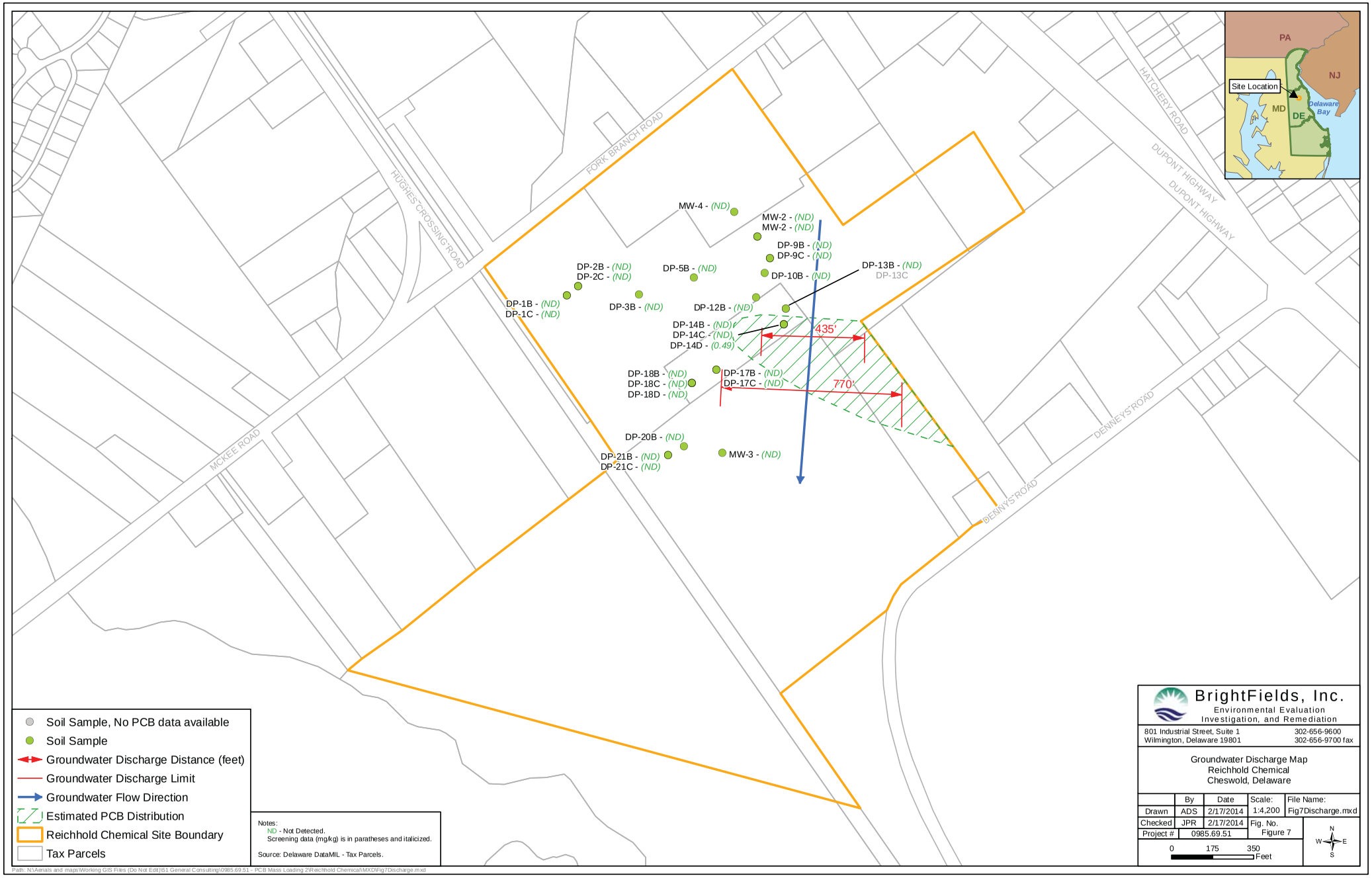
FORK BRANCH ROAD
HUGHES CROSSING ROAD
MCKEE ROAD
HATCHERY ROAD
DUPONT HIGHWAY
DUPONT HIGHWAY
DENNEY'S ROAD
DENNY'S ROAD
MW-4 - (ND)
MW-2 - (ND)
MW-2 - (ND)
DP-9B - (ND)
DP-9C - (ND)
DP-2B - (ND)
DP-2C - (ND)
DP-5B - (ND)
DP-10B - (ND)
DP-13B - (ND)
DP-13C
DP-1B - (ND)
DP-1C - (ND)
DP-3B - (ND)
DP-12B - (ND)
DP-14B - (ND)
DP-14C - (ND)
DP-14D - (0.49)
435'
DP-18B - (ND)
DP-18C - (ND)
DP-18D - (ND)
DP-17B - (ND)
DP-17C - (ND)
770'
DP-20B - (ND)
DP-21B - (ND)
DP-21C - (ND)
MW-3 - (ND)
PA
NJ
Site Location
MD
DE
Delaware Bay
Soil Sample, No PCB data available
Soil Sample
Groundwater Discharge Distance (feet)
Groundwater Discharge Limit
Groundwater Flow Direction
Estimated PCB Distribution
Reichhold Chemical Site Boundary
Tax Parcels
Notes:
ND - Not Detected.
Screening data (mg/kg) is in paratheses and italicized.
Source: Delaware DataMIL - Tax Parcels.
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
Reichhold Chemical
Cheswold, Delaware
By
Date
Scale:
File Name:
Drawn
ADS
2/17/2014
1:4,200
Fig7Discharge.mxd
Checked
JPR
2/17/2014
Fig. No.
Project #
0985.69.51
Figure 7
0
175
350
Feet
N
W
E
S
Path: N:\Aerials and maps\Working GIS Files (Do Not Edit)\51 General Consulting\0985.69.51 - PCB Mass Loading 2\Reichhold Chemical\MXD\Fig7Discharge.mxd

Tables

Table 1
PCB Screening Results For Soil
Reichhold Chemical (DE-0245)
Dover, DE

Sample Identification	Sample Depth (feet bgs)	Sampling Company	Report Name	Report Date	Total PCBs DNREC-SIRS Screening Level (January 2014) (mg/kg) NCA
DP-10A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-10B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-11A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-12A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-12B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-13A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-13B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-14A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-14B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-14C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-14D	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	0.49
DP-17A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-17B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-17C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-18A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-18B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-18C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-18D	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-19A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-1A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-1B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	NA
DP-1C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-20A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-20B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-21A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-21B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-21C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-2A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-2B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-2C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-3A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
DP-3B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	0.49
DP-5A	< 2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	1992	ND
DP-5B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	1992	ND
DP-9A	<2'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	1992	ND
DP-9B	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	1992	ND
DP-9C	0' - <18'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	1992	ND
MW-2	14' -16'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	1992	ND
MW-2	40.5' - 44.5'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
MW-3	10' - 12'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
MW-3	14' - 16'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND
MW-4	9.5' - 11.5'	DNREC	Reichold Chemical Facility Evaluation Findings of Fact	Jun-96	ND

Note: All results reported in mg/kg.

Qualifiers:
bgs - Below ground surface
NCA - No criteria available
ND - Not detected

Table 2
PCB Analytical Results For Soil
Reichhold Chemical (DE-0245)
Dover, DE

Sample Identification	Sample Depth (feet bgs)	Sampling Company	Report Name	Report Date	Aroclor-1016 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.39		Aroclor-1221 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14		Aroclor-1232 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14		Aroclor-1242 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22		Aroclor-1248 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22		Aroclor-1254 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.11		Aroclor-1260 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	
PE-409-01-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.18	
PE-409-02-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.055	
PE-409-03-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
PE-409-04-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.12	
PE-409-05-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**2.3**	
PE-409-05-0006-2b	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.085	
PE-409-06-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**1.1**	
PE-409-06-0006-2	2' - 2.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.24**	
PE-409-07-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**1.4**	
PE-409-07-0006-2	2' - 2.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.095	
PE-409-08-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**2.6**	
PE-409-08-0006-2	2' - 2.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.06	
PE-430-01-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		0.18		ND		**0.52**	
PE-430-01-0006-2	2' - 2.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.15	
PE-430-02-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		0.042		ND		ND		0.2	
PE-430-03-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.093	
PE-430-04-0006	1' - 1.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.57**	
PE-440-01-0006	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**74**	
PE-440-01-0006-2C	4' - 4.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.14	
PE-440-02-0006	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.24**	
PE-440-03-0006	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**5.6**	
PE-440-03-0006-2B	4' - 4.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.47**	
PE-440-04-0006	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.068	
PE-440-05-0006	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.036	
PE-440-06-0006	3' - 3.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.063	
PE-440-07-0006	4' - 4.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.097	
PE-440-08-0006-2B	4' - 4.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.4**	
PE-440-09-0006-2B	4' - 4.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**80**	
PE-440-09-0006-3	5' - 5.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.054	
PE-440-10-0006-2B	4' - 4.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.89**	
PE-440-11-0006	5' - 5.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
RCI-16	0' - >2'	DNREC	Site Inspection	1992	0.089	U	0.089	U	0.089	U	0.089	U	0.089	U	0.18	U	0.18	U
RCI-17	0' - >2'	DNREC	Site Inspection	1992	0.091	U	0.091	U	0.091	U	0.091	U	0.091	U	0.18	U	0.18	U
RCI-18	0' - >2'	DNREC	Site Inspection	1992	0.088	U	0.088	U	0.088	U	0.088	U	0.088	U	0.18	U	0.18	U
RCI-19	0' - >2'	DNREC	Site Inspection	1992	0.091	U	0.091	U	0.091	U	0.091	U	0.091	U	0.18	U	0.18	U
RCI-20	0' - >2'	DNREC	Site Inspection	1992	0.095	U	0.095	U	0.095	U	0.095	U	0.095	U	0.19	U	**0.65**	
RCI-21	0' - >2'	DNREC	Site Inspection	1992	0.09	U	0.09	U	0.09	U	0.09	U	0.09	U	0.18	U	0.18	
SS-409-05-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-05-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-05-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-05-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-06-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**2.2**	
SS-409-06-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.056	
SS-409-06-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.041	
SS-409-06-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-07-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		**0.95**	
SS-409-07-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-07-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-07-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-08-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		**0.68**		ND	
SS-409-08-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-08-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-08-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-09-0006	0' - 0.5	CH2MHILL	TSCA Soil Remediation Report	Oct-11	NA		NA		NA		NA		NA		NA		0.059	
SS-409-09-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-09-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-09-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-10-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		0.049	
SS-409-10-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	
SS-409-10-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND		ND		ND		ND		ND		ND		ND	

Table 2
PCB Analytical Results For Soil
Reichhold Chemical (DE-0245)
Dover, DE

Sample Identification	Sample Depth (feet bgs)	Sampling Company	Report Name	Report Date	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260
					DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.39	DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14	DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14	DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.11	DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22
SS-409-10-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-409A-01-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	0.096
SS-409A-02-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	0.041
SS-409B-01-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**18**
SS-409B-02-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**5.7**
SS-423-07-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	**0.28**	ND	ND	ND
SS-423-08-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	**0.23**	ND	ND	0.16
SS-423-09-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-423-10-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-430-07-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**1.9**
SS-430-08-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**3**
SS-430-09-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	0.14
SS-430-10-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**1.2**
SS-440-01-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**73**
SS-440-02-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**14**
SS-440-03-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**84**
SS-440-04-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-05-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-05-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-05-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-05-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-06-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	0.14
SS-440-06-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-06-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-06-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-07-0006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**19**
SS-440-07-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**3.1**
SS-440-07-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**1.4**
SS-440-07-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**2.6**
SS-440-08-0006	0' -0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**0.38**
SS-440-08-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-08-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-08-2436	2' - 3	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-09-006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	**0.26**
SS-440-09-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	0.046
SS-440-09-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-09-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-10-006	0' - 0.5'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	0.059
SS-440-10-0612	0.5' - 1'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-10-1224	1' - 2'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND
SS-440-10-2436	2' - 3'	CH2MHILL	TSCA Soil Remediation Report	Oct-11	ND	ND	ND	ND	ND	ND	ND

Note: All results reported in mg/kg.

Qualifiers:
bgs - Below ground surface
NCA - No criteria available
U - Sample not detected above the laboratory method detection limit
ND - Not detected
NA - Not available from reports provided to Brightfields
Bold and shaded - Exceeds DNREC-SIRS January 2014 Screening Levels

Table 3
PCB Analytical Results For Groundwater
Reichhold Chemical (DE-0245)
Dover, DE

Sample Identification	Screen Depth (feet bgs)	Sampling Company	Report Name	Report Date	Aroclor-1016		Aroclor-1221		Aroclor-1232		Aroclor-1242		Aroclor-1248		Aroclor-1254		Aroclor-1260	
					DNREC-SIRS Screening Level (January 2014) (ug/L) 0.11		DNREC-SIRS Screening Level (January 2014) (ug/L) 0.004*		DNREC-SIRS Screening Level (January 2014) (ug/L) 0.004*		DNREC-SIRS Screening Level (January 2014) (ug/L) 0.034*		DNREC-SIRS Screening Level (January 2014) (ug/L) 0.034*		DNREC-SIRS Screening Level (January 2014) (ug/L) 0.031*		DNREC-SIRS Screening Level (January 2014) (ug/L) 0.034*	
RCI-3	>2'	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U
RCI-4	>'2	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U
RCI-5	>'2	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U
RCI-6	>'2	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U
RCI-7	>'2	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U
RCI-8	>'2	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U
RCI-9	>'2	DNREC	Site Inspection	1992	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U

Note: All results reported in ug/L.

Qualifiers:
bgs - Below ground surface
* - Screening level likely below the routine method detection
U - Sample not detected above the laboratory method detection

Site Photographs

Looking at the main building from the northeast, the grass is well kept and water is ponded along Fork Branch Road.

Right outside the parking lot next to the main building where there are patches of maintained grass.

The entrance along Fork Branch Road northeast of the main building where there is a parking lot with grass growing up through the broken pavement and a grassy field in the background.

The parking lot to the northeast with the field and forested area further south which wrap around the site along the eastern boundary.

The portion of the site west of the railroad tracks with overgrown grass closer to the main building and a wooded area in the background.

Southwest of the main building where equipment is fenced and grass is kept short. Higher grass and weeds are beyond the equipment and a wooded area is in the background.

BrightFields, Inc.

Overland Flow Calculations

PCB Loading Calculations from the Revised Universal Soil Loss Equation (RUSLE)
Reichhold Chemical (DE-0245)
Dover, DE

Surface PCB Concentration | 0.41 | mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	175	10^2 ft-tonf-in/ac-hr-yr
K	Soil Erodibility	0.24	0.01 ton-ac-hr/ ac-ft-tonf-in
	Erodible Area	3.3	Acres
LS	Topographic Factor	0.18	Dimensionless
C	Cover and Management Factor	0.013	Dimensionless
P	Support Practice Factor	1	Dimensionless
A	Average Annual Soil Loss	0.15	ton/ac-yr

PCB Loading via Overland Flow | 0.18 | **grams/year - PCBs**

BrightFields, Inc.

Groundwater Transport Calculations

PCB Loading Calculations - Groundwater Discharge to Surface Water
Reichhold Chemical (DE-0245)
Dover, Delaware

TABLE A
Groundwater Discharge Calculations

Hydraulic Conductivity (K) (ft/day)	Horizontal Gradient (i) (ft/ft)	Cross-sectional Area (A) (ft2)	Groundwater Discharge*	
			Liters/day	Gallons/ day
18.7	0.0066	3,700	12,900	3,420
18.7	0.0096	3,700	19,000	5,000

TABLE B
Potential Groundwater PCB Concentration Calculation

Maximum Soil PCB (µg/kg)	f_{OC} (fraction of organic carbon)		Pore Water PCB (µg/L)	
			Maximum	Minimum
490	0.01	0.05	0.54	0.11

TABLE C
Estimated Mass Loadings of PCBs in Groundwater to Fork Branch

Maximum Estimated Groundwater Concentration (µg/L)	Estimated PCB Mass Loading (g/yr)	
	Minimum	Maximum
0.54	2.5	4