

## **Appendix I**

### **Compliance Averaging Memorandum for Vanadium in Soil**

## Memorandum

To	Ian Curtis, NJDEP	Page 1
CC	Ronald Riccio, Site Administrator James Ray, Site Administrator PM Nancy Colson, Site Administrator Assistant Prabal Amin, WESTON Solutions, Inc. Laura Amend-Babcock, WESTON Solutions, Inc. Itza Wilson, City of Jersey City Peter Baker, City of Jersey City David Spader, EndPoint Environmental and Infrastructure, LLC. Dorothy Laguzza, K&L Gates Joe Lagrotteria, K&L Gates Jody Overmyer, PPG Aimee Ruitter, AECOM Carolyn Scott, AECOM Mark Nichols, AECOM	
Subject	Conrail Right-of-Way (AOC 1) Compliance Averaging for Vanadium in Soil	
From	Claire Hunt	
Date	January 31, 2024	

### **Introduction**

This memorandum provides documentation of attainment of compliance for vanadium in soil with an alternative remediation standard (ARS) for vanadium, as documented in Appendix G of the December 2018 *Technical Execution Plan - Site Soils, PPG Site 107 Fashionland - 18 Chapel Avenue, Jersey City, New Jersey*, for a site-specific soil sample set from Conrail Right-of-Way (AOC 1) in accordance with the NJDEP's *Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria* (July 2021, Version 2.0).

The following soil sample (**Table 1**) with a vanadium concentration greater than the ARS for vanadium of 390 milligrams per kilogram (mg/kg) remains in place within Conrail Right-of-Way (AOC 1):

**Table 1: Soil Sample Remaining with Vanadium Concentrations Greater than the ARS**

Sample ID	Depth Interval (ft bgs)	Sample Elevation (ft NAVD88)	Sample Date	Vanadium (mg/kg)
SW-A34 (2.0-2.5)	2.0 - 2.5	16.0 - 15.5	9/5/2019	416

**Notes:**

bgs - below ground surface  
 ft - foot or feet

**Figure 1** depicts boring/sample locations, as well as the analytical result for the soil sample where vanadium remains in place within Conrail Right-of-Way (AOC 1) at a concentration greater than the ARS.

In the memorandum, *Hudson County Chromium (HCC), Site 107 – 18 Chapel Avenue, SRP Program Interest No. G000008728, Vanadium Exceedances in Fill Unrelated to CCPW Fill*, submitted to NJDEP on May 3, 2013, it was documented that fill materials in the “Vanadium-only exceedance area” are unrelated to CCPW filling operations and are not the responsibility of PPG (CB&I, 2013a). Based on the close proximity of sample SW-A34 (2.0-2.5) to the Vanadium-only exceedance area, it is expected that this exceedance is associated with historic fill material and not CCPW-related impacts.

Boring logs, laboratory reports, and data validation reports for samples reported herein are included as part of the *Remedial Action Report, Conrail Right-of-Way (AOC 1), Soil, Draft*, except where otherwise noted.

**Delineation**

The soil sample with a vanadium concentration greater than the ARS that remains in place within Conrail Right-of-Way (AOC 1) is delineated as presented in **Table 2**:

**Table 2: Delineation of Sample SW-A34(2.0-2.5)**

Location ID	Depth Interval (ft bgs)	Sample Elevation (ft NAVD88)	Date Collected	Vanadium Result (mg/kg)	Direction
107_M038	3.7 - 4.2	18.4 - 17.9	02/09/11	230	North
107_M036	3.5 - 4.0	17.6 - 17.1	02/09/11	102	East
107_M034	3.5 - 4.0	11.4 - 10.9	02/10/11	27.6	South
107_M034N	7.5 - 8.0	13.3 - 12.8	01/25/19	25.7	West
BS-A20	4.7 - 5.2	14.8 - 14.3	01/29/19	24.1	Vertical

**Notes:**

bgs - below ground surface  
 ft - foot or feet  
 mg/kg - milligram/kilogram  
 NAVD88 - North American Vertical Datum of 1988

### **Functional Areas**

The vanadium ARS is based on the ingestion-dermal pathway. A request for an ARS for vanadium was submitted to NJDEP by Arcadis, on behalf of PPG, as part of Appendix G of the August 10, 2018 *Technical Execution Plan – Site Soils, Site 107 Fashionland*, which was approved on November 7, 2018. The functional area for the ingestion-dermal pathway is conservatively limited to 0.25 acre for residential use, although this property is currently an industrial use property. The extent of the functional area within the site boundary is shown on **Figure 1**. The shape is generally rectangular within the site boundary.

Remaining samples within the functional area extents were collected from deeper than 2 feet below ground surface and are considered a part of the functional area for the calculation.

### **Compliance Averaging**

Compliance with the vanadium ARS is demonstrated through spatial averaging. Theissen polygons were created within the functional area is shown on **Figure 1**. The sample selection process is as follows:

1. The samples for vanadium that fall within the functional area (horizontally and vertically), are identified.
2. The maximum concentration is selected at each sample location for use in the weighted average (refer to **Table 3** below). The maximum of the concentration for detections or the Method Detection Limit (MDL)/Reporting Limit (RL) for non-detects is selected.

**Table 3: Samples Used to Determine Weighted Average Concentration for Sample SW-A34 (2.0-2.5)**

Location ID	Sample Depth (ft bgs)	Sample Elevation (ft NAVD88)	Date Collected	Maximum Vanadium Result (mg/kg)	Area (sf)	Area x Maximum Vanadium Result (sf*mg/kg)
107_M032	11.0 - 11.5	6.4 - 5.9	2/10/2011	17	186	3,162
107_M034N	3.3 - 3.8	13.3 - 12.8	1/25/2019	26	1,124	29,224
BS-A17	4.0 - 4.5	13.4 - 12.9	1/25/2019	22	116	2,552
BS-A17I	9.2 - 9.7	8.5 - 8.0	2/20/2019	31	43	1,333
BS-A18	4.6 - 5.1	13.2 - 12.7	1/25/2019	51	1,226	62,526
BS-A19	3.9 - 4.4	13.0 - 12.5	1/25/2019	30	962	28,860
BS-A20	4.7 - 5.2	14.8 - 14.3	1/29/2019	24	348	8,352
SW-A30 (2.0-2.5)	2.7 - 3.2	14.5 - 14.0	3/12/2019	55	823	45,265
SW-A30 (4.0-4.5)	4.8 - 5.3	12.5 - 12.0	3/12/2019	17	33	561
SW-A30 (6.0-6.5)	7.0 - 7.5	10.4 - 9.9	3/12/2019	21	19	399
SW-A30 (8.0-8.5)	8.7 - 9.2	8.9 - 8.4	3/12/2019	18	17	306
SW-A34 (2.0-2.5)	2.0 - 2.5	16.0 - 15.5	9/5/2019	416	6,107	2,540,512
Total					11,004	2,723,052

**Notes:**

bgs - below ground surface  
 ft - foot or feet  
 mg/kg - milligrams per kilogram  
 NAVD88 - North American Vertical Datum of 1988  
 sf - square feet

Weighted Average Concentration = 2,723,052 sf x mg/kg / 11,004 sf = 247 mg/kg

**Conclusion**

The spatially weighted average vanadium concentration within the study area at Conrail Right-of-Way (AOC 1) for SW-A34 (2.0-2.5) is 247 mg/kg, which is compliant with the 390 mg/kg ARS.

**Attachments:**

**Figure 1** Compliance Averaging Evaluation - Vanadium in Soil - ARS - Conrail Right-of-Way (AOC 1) - Functional Area 1

**Attachment 1** Boring Logs






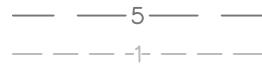

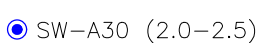
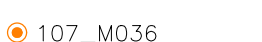



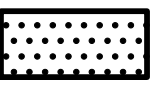
**Attachment 2** Laboratory Analytical Reports (*Provided Separately*)

**Attachment 3** Data Validation Reports (*Provided Separately*)

**Figure 1**

File: C:\Users\NicholsM1\AECOM\PPG - GDS\910 CAD\20 SHEETS\PAR\Conrail Excavation RAR\CAM\2024-01-11 CAM Figure.dwg Layout: 1 User: NicholsM1 Plotted: Jan 31, 2024 - 9:02am Xref's:

**LEGEND**

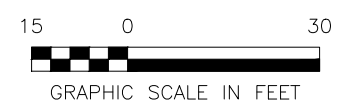
-  PROPERTY LINE
-  APPROXIMATE PROPERTY LINE
-  2023 MOBILIZATION EXCAVATION EXTENTS
-  2018 MOBILIZATION EXCAVATION EXTENTS
-  EXISTING RAILROAD TRACKS
-  GROUND SURFACE ELEVATION CONTOURS 1' INTERVAL, 5' INDEX
-  CONRAIL RIGHT-OF-WAY (AOC 1) BOUNDARY
-  SW-A30 (2.0-2.5) SOIL SAMPLE LOCATION - REMAINING-IN-PLACE IN SOIL - CONRAIL RIGHT-OF-WAY
-  107\_M036 DELINEATION SOIL SAMPLE LOCATION - REMAINING-IN-PLACE IN SOIL - OUTSIDE CONRAIL RIGHT-OF-WAY (AOC 1) BOUNDARY/FUNCTIONAL AREA
-  LOCATION OF SOIL SAMPLE WITH V CONCENTRATION GREATER THAN THE ARS WITHIN FUNCTIONAL AREA
-  THIESSEN POLYGON
-  FUNCTIONAL AREA 1
-  VANADIUM-ONLY AREA

**ACRONYMS:**

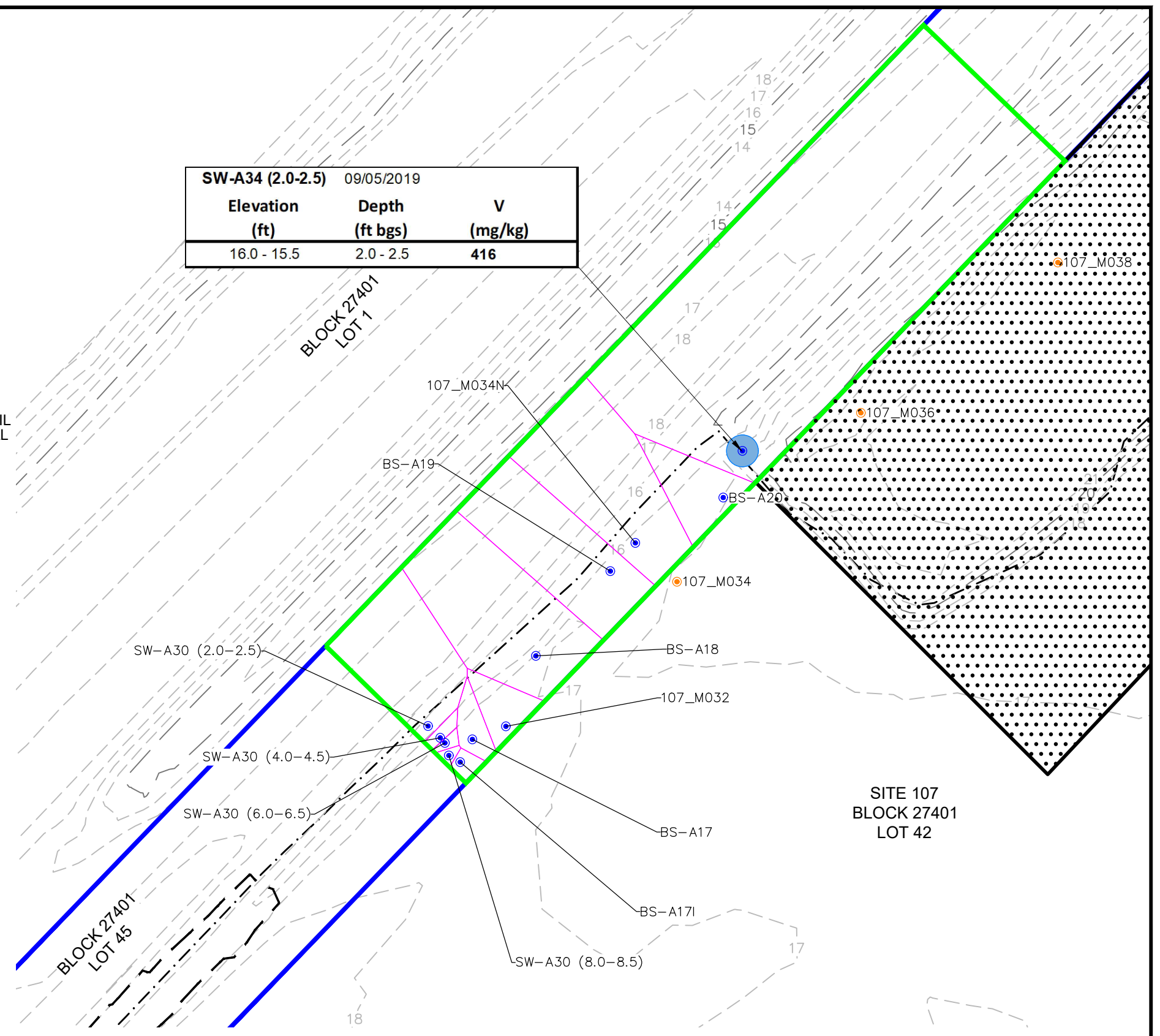
- AOC AREA OF CONCERN
- ARS ALTERNATIVE REMEDIATION STANDARD
- BGS BELOW GROUND SURFACE
- ft FEET
- mg/kg MILLIGRAMS PER KILOGRAM
- V VANADIUM

**NOTES:**

1. V RESULTS ARE SHOWN IN mg/kg.



<b>SW-A34 (2.0-2.5)</b>		09/05/2019
<b>Elevation (ft)</b>	<b>Depth (ft bgs)</b>	<b>V (mg/kg)</b>
16.0 - 15.5	2.0 - 2.5	416



PPG CONRAIL RIGHT-OF-WAY (AOC 1) JERSEY CITY, NEW JERSEY		<b>COMPLIANCE AVERAGING EVALUATION</b> VANADIUM IN SOIL - ARS CONRAIL RIGHT-OF-WAY (AOC 1) FUNCTIONAL AREA 1
DATE: 01/11/2024	DRWN: MDN	<b>FIGURE 1</b>

## **Attachment 1 Boring Logs**

Boring logs are not available for sample locations with a "BS" or "SW" designation, which are post-excavation samples collected during the 2018 Site 107 Remedial Action.



## Soil Boring/Well Details: 107\_M034

**Project No:** 10236-1  
**Project:** Block 107  
**Client:** PPG Industries  
**Location:** Jersey City, NJ

**Northing:** 0  
**Easting:** 0  
**Elevation:** 0  
**Total Depth:** 21.0

**Water Level:** 20.0  
**Sampling Method:** Geoprobe  
**Sample Interval:** See Log  
**Logged By:**

SAMPLE				SUBSURFACE PROFILE			Remarks	Well Completion Details	Elevation (Ft. MSL)	
Sample #	Blow Counts	Recovery (inches)	VOC (PPM)	Depth (ft/m)	Symbol	Description				Formation
M034-0.0	36	0.0	0.0	1		Black of SAND and GRAVEL, some Silt and Cinder, little Rubber, trace Glass and Wood.				
M034-3.0				3		1				Brown of SAND and GRAVEL, some Silt and Glass, trace Cinder, Wood and green Plastic chips.
M034-3.5				4						Red/brown of SAND and GRAVEL, some Silt and Sandstone, little Roots.
M034-5.0	48	0.0	0.0	5		Red/brown of SAND and GRAVEL, some Silt and Sandstone, little Roots.				
M034-7.5				7						Red/brown silty SAND, some Gravel and Sandstone, little Roots.
M034-9.5				8						Brown silty SAND, some Roots.
M034-13.5	53	0.0	0.0	10		Brown SILT, some brown mf Sand.				
M034-13.5				11						Gray silty CLAY, some gray mf SAND, trace Sandstone.
M034-13.5				12						
				13						
				14						
				15						



Drilling Company: EMC, Inc. Driller: Ryan Zajak Drilling Method: Geoprobe Auger Size: NA Hole Diameter:	<b>DRESDNER ROBIN</b> 371 Warren Street P.O. Box 38 Jersey City, NJ 07302	Casing Diameter: NA Date Start: 2/10/2011 Date Finish: 2/10/2011 Checked By: GG Sheet 1 of 2
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## Soil Boring/Well Details: 107\_M034

**Project No:** 10236-1  
**Project:** Block 107  
**Client:** PPG Industries  
**Location:** Jersey City, NJ

**Northing:** 0  
**Easting:** 0  
**Elevation:** 0  
**Total Depth:** 21.0

**Water Level:** 20.0  
**Sampling Method:** Geoprobe  
**Sample Interval:** See Log  
**Logged By:**

SAMPLE				SUBSURFACE PROFILE			Remarks	Well Completion Details	Elevation (Ft. MSL)		
Sample #	Blow Counts	Recovery	VOC (PPM)	Depth	Symbol	Description				Formation	
M034-17.5		30	0.0	16		Brown red silty SAND and SANDSTONE, some Rock and brown-red cf Sand.					
				17							
				18							
				19							
				20							
				12	0.0	20		Brown-red silty SAND and ROCK, some Sandstone and red/brown cf Sand.		WET	
						21					
						22					
						23					
						24					
25						Pushed to 24 feet, but only had 1 foot of recovery and had rock tense @ 21 feet					
26											
27											
28											
29											
30	9										

Drilling Company: EMC, Inc.  
 Driller: Ryan Zajak  
 Drilling Method: Geoprobe  
 Auger Size: NA  
 Hole Diameter: 3 inches

**DRESDNER ROBIN**  
 371 Warren Street  
 P.O. Box 38  
 Jersey City, NJ 07302

Casing Diameter: NA  
 Date Start: 2/10/2011  
 Date Finish: 2/10/2011  
 Checked By: GG  
 Sheet: 2 of 2

# Soil Boring/Well Details: 107\_M036

**Project No:** 10236-1  
**Project:** Block 107  
**Client:** PPG Industries  
**Location:** Jersey City, NJ

**Northing:** 0  
**Easting:** 0  
**Elevation:** 0  
**Total Depth:** 24.0

**Water Level:** 11.0  
**Sampling Method:** Geoprobe  
**Sample Interval:** See Log  
**Logged By:** GG

SAMPLE				SUBSURFACE PROFILE			Remarks	Well Completion Details	Elevation (Ft. MSL)
Sample #	Blow Counts	Recovery (inches)	VOC (PPM)	Depth (ft/m)	Symbol	Description			
M036-0.0		30	0.0	1		Black SHINGLE, little Sand and Gravel, trace Silt, trace Glass, trace Ash.			
				2					
				3		1			
M036-3.5				4					
		32	0.0	5		Brown f SAND, some Gravel and Ash, little Silt, trace Brick, trace Concrete.			
	6								
	7			2					
M036-7.5	8								
		42	0.0	9		Gray-brown to orange-brown SILT, little f Sand, trace Gravel, trace Clay, mottled.			
M036-8.5	10			3					
	11								
	12								
				13		Red-brown f SAND, little Gravel, little Silt, little dark brown Gravel, trace Wood.		WET	
	14								
	15								
M036-12.5	16			4					
				17		Red-brown SILT, little Gravel, little Sand.			
				18		Red-brown f SAND, some clayey Silt, little Gravel, trace mf black Sand.			
				19		Blue-gray silty CLAY, trace f Sand.			
				20					
				21					
				22					
				23					
				24					

**Drilling Company:** EMC, Inc.  
**Driller:** Ryan Zajak  
**Drilling Method:** Geoprobe  
**Auger Size:** NA  
**Hole Diameter:**

**DRESDNER ROBIN**  
 371 Warren Street  
 P.O. Box 38  
 Jersey City, NJ 07302

**Casing Diameter:** NA  
**Date Start:** 2/9/2011  
**Date Finish:** 2/9/2011  
**Checked By:** GG  
 Sheet 1 of 2

## Soil Boring/Well Details: 107\_M036

**Project No:** 10236-1  
**Project:** Block 107  
**Client:** PPG Industries  
**Location:** Jersey City, NJ

**Northing:** 0  
**Easting:** 0  
**Elevation:** 0  
**Total Depth:** 24.0

**Water Level:** 11.0  
**Sampling Method:** Geoprobe  
**Sample Interval:** See Log  
**Logged By:** GG

SAMPLE				SUBSURFACE PROFILE			Remarks	Well Completion Details	Elevation (Ft. MSL)				
Sample #	Blow Counts	Recovery	VOC (PPM)	Depth	Symbol	Description				Formation			
M036-16.5		28	0.0	16		Gray f SAND, some Silt.	MOIST						
				17		Red-brown f SAND, some Silt, little Gravel.							
				18									
				19									
				20									
		21	40	0.0	22					Red-brown SILT, some Gravel, little f Sand.			
		23			Red-brown SILT, little Gravel, little brown f Sand, mottled.								
		24			Red-brown f SAND, some Gravel, little Clayey Silt.								
		25			26					END OF BORING			
		27			28								
29			30										
31													
32													

**Drilling Company:** EMC, Inc.  
**Driller:** Ryan Zajak  
**Drilling Method:** Geoprobe  
**Auger Size:** NA  
**Hole Diameter:** 3 inches

**DRESDNER ROBIN**  
 371 Warren Street  
 P.O. Box 38  
 Jersey City, NJ 07302

**Casing Diameter:** NA  
**Date Start:** 2/9/2011  
**Date Finish:** 2/9/2011  
**Checked By:** GG  
**Sheet:** 2 of 2

## Soil Boring/Well Details: 107\_M038

**Project No:** 10236-1  
**Project:** Block 107  
**Client:** PPG Industries  
**Location:** Jersey City, NJ

**Northing:** 0  
**Easting:** 0  
**Elevation:** 0  
**Total Depth:** 24.0

**Water Level:** 10.5  
**Sampling Method:** Geoprobe  
**Sample Interval:** See Log  
**Logged By:** GG

SAMPLE				SUBSURFACE PROFILE			Remarks	Well Completion Details	Elevation (Ft. MSL)
Sample #	Blow Counts	Recovery (inches)	VOC (PPM)	Depth (ft/m)	Symbol	Description			
M038-0.0		28	0.0	1		Black SHINGLE, little Sand, trace Ash, trace Gravel, trace Silt.			
				2					
				3		1			Brown f SAND, some Silt, little Gravel, trace Concrete, trace Brick.
M038-3.5				4					
				5					Gray f SAND, some Silt, little Brick and Gravel.
				6					CONCRETE.
				7		2			Brown to red-brown f SAND, some Silt, little Gravel, trace Ash.
				8					
M038-8.0				9					Red-brown f SAND, some Silt and Gravel, trace gray/brown Silt.
				10		3			Red-brown f SAND, some Silt, little Gravel.
				11					
M038-12.0				12					WET
				13		4			
				14					
				15					

**Drilling Company:** EMC, Inc.  
**Driller:** Ryan Zajak  
**Drilling Method:** Geoprobe  
**Auger Size:** NA  
**Hole Diameter:**

**DRESDNER ROBIN**  
 371 Warren Street  
 P.O. Box 38  
 Jersey City, NJ 07302

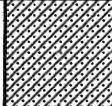
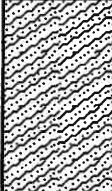

**Casing Diameter:** NA  
**Date Start:** 2/9/2011  
**Date Finish:** 2/9/2011  
**Checked By:** GG  
 Sheet 1 of 2

## Soil Boring/Well Details: 107\_M038

**Project No:** 10236-1  
**Project:** Block 107  
**Client:** PPG Industries  
**Location:** Jersey City, NJ

**Northing:** 0  
**Easting:** 0  
**Elevation:** 0  
**Total Depth:** 24.0

**Water Level:** 10.5  
**Sampling Method:** Geoprobe  
**Sample Interval:** See Log  
**Logged By:** GG

SAMPLE				SUBSURFACE PROFILE			Remarks	Well Completion Details	Elevation (Ft. MSL)	
Sample #	Blow Counts	Recovery	VOC (PPM)	Depth	Symbol	Description				Formation
M038-16.0		48	0.0	16		Gray clayey SILT, little gray f Sand, trace f black Sand, trace Peat.		MOIST		
				17		Gray/brown silty CLAY, trace f Sand, trace red-brown Silt.				
				18		Light gray f SAND, some Silt, little brown Silt, mottled.				
				19		Red-brown GRAVEL, some mf Sand, little Silt.				
				20						Red-brown SILT, some Gravel, little Sand, trace brown Silt.
		21								
		22	32	0.0	23					Red-brown GRAVEL, little Sand, trace Silt.
		24			END OF BORING					
		25								
		26	8							
27										
28										
29										
30	9									
30										

**Drilling Company:** EMC, Inc.  
**Driller:** Ryan Zajak  
**Drilling Method:** Geoprobe  
**Auger Size:** NA  
**Hole Diameter:** 3 inches

**DRESDNER ROBIN**  
 371 Warren Street  
 P.O. Box 38  
 Jersey City, NJ 07302

**Casing Diameter:** NA  
**Date Start:** 2/9/2011  
**Date Finish:** 2/9/2011  
**Checked By:** GG  
**Sheet:** 2 of 2

**Attachment 2 Laboratory Analytical Reports (*Provided Separately*)**

**Attachment 3 Data Validation Reports (*Provided Separately*)**