

# Appendix E-2

## MSA Sample Results

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Miscellaneous Analyses

SDG # JD17176

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39871R  
Review Level: Tier II  
Project: **30065658.0003**

## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17176 for samples collected in association with the PPG Industries Site at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					MISC
SW-B43(6.0-6.5)	JD17176-1	Soil	12/04/2020		X
SW-B43(8.0-8.5)	JD17176-2	Soil	12/04/2020		X
SW-B42(0.0-0.5)	JD17176-3	Soil	12/04/2020		X
SW-B42(2.0-2.5)	JD17176-4	Soil	12/04/2020		X
SW-B42(4.0-4.5)	JD17176-5	Soil	12/04/2020		X
SW-B42(6.0-6.5)	JD17176-6	Soil	12/04/2020		X
SW-B42(8.0-8.5)	JD17176-7	Soil	12/04/2020		X
SW-B42(9.0-9.5)	JD17176-8	Soil	12/04/2020		X
FB	JD17176-9F	Soil	12/04/2020		X

**Notes:**

MISC - Miscellaneous analysis includes Hexavalent Chromium, Sulfide, TOC, Ferrous Iron and pH.

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9045D, ASTM D1498-76M, SM4500S2-A-11 and LLOYD KAHN 1988 MOD. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJ DEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Soil	21 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

MS analysis was performed on sample ID SW-B43(6.0-6.5). Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B43 (6.0-6.5)	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but $<$ 75%	Non-detect	UJ-
	Detect	J-
Spike recovery $<$ 50%	Non-detect	R
	Detect	R
Spike recovery $>$ 125%	Non-detect	No Action
Spike recovery $>$ 125% but $\leq$ 150%	Detect	J+
Spike recovery $>$ 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are  $<$  50% or  $>$  150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the  $<$  50% or  $>$  150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis was performed on sample ID SW-B43(6.0-6.5). The laboratory duplicate analysis exhibited a RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Dilution Factor		X		X	
Total vs Dissolved %D	X				X

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation



## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SW 846 9045D	Soil	24 hours of receipt at laboratory	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24hours from collection to analysis	Cool to <6 °C
Sulfide SM4500S2- A-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon LLOYD KAHN 1988 MOD	Soil	28 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Method	Holding Time	Criteria
SW-B43(6.0-6.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	16 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	16 days	7 days from collection to analysis
SW-B43(8.0-8.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
SW-B42(0.0-0.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
SW-B42(2.0-2.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
SW-B42(4.0-4.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
SW-B42(6.0-6.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
SW-B42(8.0-8.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
SW-B42(9.0-9.5)	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory
FB	pH by SW 846 9045D	> 48hours	24 hours of receipt at laboratory

Sample results associated with sample locations analyzed outside holding time were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

## DATA REVIEW REPORT

### 3. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of  $\pm$  the RL is applied.

The laboratory duplicate analysis was not performed on samples from this data package.

### 4. MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

The MS/MSD analysis was not performed on samples from this data package.

### 5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A filed duplicate sample was not collected for the samples from this SDG.

### 6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW 8469045D, ASTM D3872-86, SM4500S2-A-11 and LLOYD KAHN 1988 MOD	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Dilution Factor		X		X	

**Notes:**

%R     Percent recovery

RPD     Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE:



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DATE: January 12, 2021

PEER REVIEW: Rachelle Borne

DATE: January 13, 2021

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





50  
FB

### CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL: 732-329-0200 FAX: 732-329-3499/3480  
www.sgs.com/ehsusa

E/PN

FED-EX Tracking #	Order Control #
SGS Quote #	SGS Job #
	801-112520-171
	JD17176

Client / Reporting Information		Project Information		Requested Analysis												Matrix Codes										
Company Name: <b>Arcaadis</b>		Project Name: <b>PRG - Site 107</b>		<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">           CRV. Inc. Sh. 5: pth         </div> <div style="border: 1px solid black; padding: 5px;">           Matrix Codes:            DW - Drinking Water            GW - Ground Water            WW - Water            SW - Surface Water            SO - Soil            SL - Sludge            SED - Sediment            LIQ - Other Liquid            AIR - Air            SOL - Other Solid            WP - Wipe            FB - Field Blank            EB - Equipment Blank            RB - Rinse Blank            TB - Trip Blank         </div> </div>												LAB USE ONLY										
Street Address: <b>10 Friends LN</b>		Street: <b>18 Chapel Ave</b>																								
City: <b>Newtown, PA 18940</b>		City: <b>Jersey, NJ</b>																								
Project Contact: <b>Jim McLaughlin</b>		Project #: <b>300650552000</b>																								
Phone #: <b>215-815-1030</b>		Client Purchase Order #:																								
Sampler(s) Name(s): <b>J. Mateo</b>		Project Manager: <b>J. McLaughlin</b>																								
MEQ/MDI Val #		Date																								
Time		Sampled by																								
Field ID / Point of Collection		Date		Time		Matrix		# of bottles		FCL		MCH		HNO <sub>3</sub>		H <sub>2</sub> O <sub>2</sub>		NONE		DI Water		MEQ/MDI		ENCODE		
1	SW-1343(6.0-6.5)	12/4/2010	1050	JM	G	S	1																			
2	SW-1343(8.0-8.5)	12/4/2010	1045	JM	G	S	1																			
3	SW-1342(0.0-0.5)	12/4/2010	1110	JM	G	S	1																			
4	SW-1342(2.0-2.5)	12/4/2010	1105	JM	G	S	1																			
5	SW-1342(4.0-4.5)	12/4/2010	1200	JM	G	S	1																			
6	SW-1342(6.0-6.5)	12/4/2010	1145	JM	G	S	1																			
7	SW-1342(8.0-8.5)	12/4/2010	1220	JM	G	S	1																			
8	SW-1342(9.0-9.5)	12/4/2010	1130	JM	G	S	1																			
9	FB	12/4/2010	113:05				1																			

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Comments / Special Instructions

\* Use site-specific Nodule crushing and homogenization procedures

Relinquished by: <b>J. Mateo</b>	Date / Time: <b>12/04/2010 11:30</b>	Received by: <b>J. McLaughlin</b>	Date / Time: <b>12/04/2010 11:30</b>	Relinquished by: <b>J. Mateo</b>	Date / Time: <b>12/04/2010 11:30</b>	Received by: <b>J. McLaughlin</b>	Date / Time: <b>12/04/2010 11:30</b>
Relinquished by: <b>J. Mateo</b>	Date / Time: <b>12/04/2010 11:30</b>	Received by: <b>J. McLaughlin</b>	Date / Time: <b>12/04/2010 11:30</b>	Relinquished by: <b>J. Mateo</b>	Date / Time: <b>12/04/2010 11:30</b>	Received by: <b>J. McLaughlin</b>	Date / Time: <b>12/04/2010 11:30</b>
Relinquished by: <b>J. Mateo</b>	Date / Time: <b>12/04/2010 11:30</b>	Received by: <b>J. McLaughlin</b>	Date / Time: <b>12/04/2010 11:30</b>	Relinquished by: <b>J. Mateo</b>	Date / Time: <b>12/04/2010 11:30</b>	Received by: <b>J. McLaughlin</b>	Date / Time: <b>12/04/2010 11:30</b>

1.8°C - ip



## Report of Analysis

<b>Client Sample ID:</b> SW-B43(6.0-6.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-1	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND <span style="color: red;">UJ</span>	0.46	0.37	mg/kg	1	12/09/20 15:31 RI	SW846	3060A/7196A
Redox Potential Vs H2	447			mv	1	12/07/20 12:14 RI	ASTM	D1498-76M
Solids, Percent	84.5			%	1	12/07/20 16:32 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.65 <span style="color: red;">J</span>			su	1	12/07/20 12:01 RI	SW846	9045D

(a) Temp of pH Reading: 18.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B43(6.0-6.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-1R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3 J	0.47	0.37	mg/kg	1	12/15/20 13:28 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.2  
4



## Report of Analysis

<b>Client Sample ID:</b> SW-B43(6.0-6.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-1RT	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	1.1 J	0.20	0.092	%	1	12/20/20 12:36 MP	MP	ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>		R		1	12/20/20 12:30 MP	MP	SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	20300	120	92	mg/kg	1	12/29/20 12:54 BM	BM	LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B43(8.0-8.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-2	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.47	0.37	mg/kg	1	12/09/20 15:39 RI		SW846 3060A/7196A
Redox Potential Vs H2	464			mv	1	12/07/20 12:18 RI		ASTM D1498-76M
Solids, Percent	83.2			%	1	12/07/20 16:32 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.90 J			su	1	12/07/20 12:14 RI		SW846 9045D

(a) Temp of pH Reading: 18.6 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B43(8.0-8.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-2R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.5  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.58	0.46	0.37	mg/kg	1	12/15/20 13:36	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(0.0-0.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-3	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 93.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.42	0.34	mg/kg	1	12/09/20 15:39 RI	SW846	3060A/7196A
Redox Potential Vs H2	411			mv	1	12/07/20 12:00 RI	ASTM	D1498-76M
Solids, Percent	93.5			%	1	12/07/20 16:32 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.35 J			su	1	12/07/20 11:59 RI	SW846	9045D

(a) Temp of pH Reading: 18.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.6  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(0.0-0.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-3R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 93.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.44	0.35	mg/kg	1	12/15/20 13:36 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(2.0-2.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-4	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/09/20 15:39 RI	SW846	3060A/7196A
Redox Potential Vs H2	457			mv	1	12/07/20 12:20 RI	ASTM	D1498-76M
Solids, Percent	88.2			%	1	12/07/20 16:32 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	8.19 J			su	1	12/07/20 12:17 RI	SW846	9045D

(a) Temp of pH Reading: 18.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(2.0-2.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-4R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/15/20 13:36 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(4.0-4.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-5	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/09/20 15:39 RI	SW846	3060A/7196A
Redox Potential Vs H2	443			mv	1	12/07/20 12:25 RI	ASTM	D1498-76M
Solids, Percent	87.1			%	1	12/07/20 16:32 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	8.15 J			su	1	12/07/20 12:21 RI	SW846	9045D

(a) Temp of pH Reading: 18.8 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B42(4.0-4.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-5R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.35	mg/kg	1	12/15/20 13:36 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(6.0-6.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-6	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.37	mg/kg	1	12/09/20 15:39 RI	SW846	3060A/7196A
Redox Potential Vs H2	437			mv	1	12/07/20 12:29 RI	ASTM	D1498-76M
Solids, Percent	85.8			%	1	12/07/20 16:32 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.19 J			su	1	12/07/20 12:24 RI	SW846	9045D

(a) Temp of pH Reading: 18.8 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(6.0-6.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-6R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.13  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.46	0.46	0.36	mg/kg	1	12/15/20 13:36 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(8.0-8.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-7	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/09/20 15:39 RI	SW846	3060A/7196A
Redox Potential Vs H2	435			mv	1	12/07/20 12:31 RI	ASTM	D1498-76M
Solids, Percent	85.7			%	1	12/07/20 16:32 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.14 J			su	1	12/07/20 12:29 RI	SW846	9045D

(a) Temp of pH Reading: 18.9 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(8.0-8.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-7R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.15  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.48	0.38	mg/kg	1	12/15/20 13:36 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(9.0-9.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-8	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.16  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.94	0.46	0.36	mg/kg	1	12/09/20 15:39 RI	SW846	3060A/7196A
Redox Potential Vs H2	420			mv	1	12/07/20 12:36 RI	ASTM	D1498-76M
Solids, Percent	84.8			%	1	12/07/20 16:32 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.49 J			su	1	12/07/20 12:32 RI	SW846	9045D

(a) Temp of pH Reading: 18.9 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B42(9.0-9.5)	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-8R	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.37	mg/kg	1	12/15/20 13:36 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.17  
4

## Report of Analysis

<b>Client Sample ID:</b> FB	<b>Date Sampled:</b> 12/04/20
<b>Lab Sample ID:</b> JD17176-9F	<b>Date Received:</b> 12/04/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/04/20 22:44	EB	SW846 7196A
Redox Potential Vs H2	437			mv	1	12/07/20 11:34	RI	ASTM D1498-76
pH <sup>a</sup>	5.44 J			su	1	12/07/20 09:22	DG	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis. Temp of pH Reading: 6.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Miscellaneous Analyses

SDG # JD17304

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39872R  
Review Level: Tier II  
Project: **30065658.0003**



## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17304 for samples collected in association with the PPG Industries Site at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					MISC
SW-B41(0.0-0.5)	JD17304-1	Soil	12/07/2020		X
SW-B40(0.0-0.5)	JD17304-4	Soil	12/07/2020		X
SW-B40(4.0-4.5)	JD17304-6	Soil	12/07/2020		X
SW-B39(0.0-0.5)	JD17304-7	Soil	12/07/2020		X
SW-B38(0.0-0.5)	JD17304-8	Soil	12/07/2020		X
SW-B38(2.0-2.5)	JD17304-9	Soil	12/07/2020		X
SW-B37(0.0-0.5)	JD17304-12	Soil	12/07/2020		X
FB(20201207)	JD17304-13	Soil	12/07/2020		X

**Notes:**

MISC - Miscellaneous analysis includes Hexavalent Chromium, Sulfide, TOC, Ferrous Iron and pH.

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X	X		
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

10. Sample IDs SW-B41(2.0 – 2.5), SW-B41(4.0 – 4.5), SW-B40(2.0 – 2.5), SW-B35(0.0 – 0.5) and SW-B35(0.0 – 0.5) were listed in chain of custody. But these samples were not analyzed as per communication from project team.

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9045D, ASTM D1498-76M, SM4500S2-A-11 and LLOYD KAHN 1988 MOD. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJ DEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Soil	21 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

MS analysis was performed on sample ID SW-B37(0.0-0.5). Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B37(0.0-0.5)	Hexavalent Chromium, Soluble	< 50%	74.6%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery ≥ 50% but < 75%	Non-detect	UJ-
	Detect	J-

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected (“R”); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 50% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

The laboratory duplicate analysis was performed on sample ID SW-B37(0.0-0.5). The laboratory duplicate analysis exhibited a RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A filed duplicate sample was not collected for the samples from this SDG.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D	X				X

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SW 846 9045D	Soil	24 hours of receipt at laboratory	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24hours from collection to analysis	Cool to <6 °C
Sulfide SM4500S2- A-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon LLOYD KAHN 1988 MOD	Soil	28 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Method	Holding Time	Criteria
SW-B37(0.0-0.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	13 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	13 days	7 days from collection to analysis
SW-B41(0.0-0.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
SW-B40(0.0-0.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
SW-B40(4.0-4.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
SW-B39(0.0-0.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
SW-B38(0.0-0.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
SW-B38(2.0-2.5)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory
FB(20201207)	pH by SW 846 9045D	> 24hours	24 hours of receipt at laboratory

Sample results associated with sample locations analyzed outside holding time were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.



## DATA REVIEW REPORT

### 3. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of  $\pm$  the RL is applied.

The laboratory duplicate analysis was not performed on samples from this data package.

### 4. MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS analysis performed on sample ID SW-B37(0.0-0.5) for total organic carbon. MS recovery exceeding the control limits tabulated below.

Sample ID	Analyte	MS Recovery
SW-B37(0.0-0.5)	Total Organic Carbon	>UL

The criteria used to evaluate MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified. The qualifications are applied to all sample results associated with this SDG.

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, all sample results are qualified as documented in the table below.

Control limit	Sample Result	Qualification
MS percent recovery 30% to 74%	Non-detect	UJ
	Detect	J
MS percent recovery <30%	Non-detect	R
	Detect	J
MS percent recovery >125%	Non-detect	No Action
	Detect	J

### 5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

## DATA REVIEW REPORT

### 6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW 8469045D, ASTM D3872-86, SM4500S2-A-11 and LLOYD KAHN 1988 MOD	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)	X				X
Dilution Factor		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE:



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DATE: January 12, 2021

PEER REVIEW: Rachelle Borne

DATE: January 13, 2021

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





SO  
FB

### CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08210  
TEL: 732-329-0200 FAX: 732-329-3499/3480  
www.sgs.com/ehausa

E

<b>Client / Reporting Information</b> Company Name: <u>ArCADIS</u> Street Address: <u>10 Friends LN</u> City: <u>Newton, PA</u> State: <u>PA</u> Zip: <u>18940</u> Project Contact: <u>Jim McLashlin</u> E-mail: <u>Jim.McLashlin@arcdas.com</u> Phone #: <u>215-815-1030</u>		<b>Project Information</b> Project Name: <u>PPG - Site 107</u> Street: <u>18 Chapel Hill</u> City: <u>Tersar City, NJ</u> State: <u>NJ</u> Billing Information (if different from Report to): Company Name: _____ Street Address: _____ City: _____ State: _____ Zip: _____ Client Purchase Order #: _____ Project Manager: <u>J. McLashlin</u> Attention: _____ Phone #: <u>(201) 893-4607</u>		<b>Requested Analysis</b> Matrix Codes: DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Waste FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank LAB USE ONLY <u>D28</u> <u>G28</u>	
<b>Turn Around Time (Business Days)</b> <input type="checkbox"/> 10 Business Days <input checked="" type="checkbox"/> 5 Business Days <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 2 Business Days <input type="checkbox"/> 1 Business Day <input type="checkbox"/> Other _____ All data available via LabLink		<b>Deliverable</b> <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NJ Reduced (Level 3) <input checked="" type="checkbox"/> Full Tier I (Level 4) <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ DKQP <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> MA MCP Criteria <input type="checkbox"/> CT MCP Criteria <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> DOD-QSMS		<b>Comments / Special Instructions</b> * USE SITE-specific Nodule crushing and homogenization procedures <a href="http://www.sgs.com/en/terms-and-conditions">http://www.sgs.com/en/terms-and-conditions</a>	
<b>Sample Custody</b> Relinquished by: <u>[Signature]</u> Date / Time: <u>12/07/20 11:20</u> Relinquished by: _____ Date / Time: _____ Relinquished by: _____ Date / Time: _____		<b>Sample Custody</b> Received By: <u>[Signature]</u> Date / Time: <u>12/7/20</u> Received By: _____ Date / Time: _____ Received By: _____ Date / Time: _____		<b>Sample Custody</b> Relinquished by: _____ Date / Time: _____ Relinquished by: _____ Date / Time: _____ Relinquished by: _____ Date / Time: _____	
Approved By (SGS PM): _____ Date: _____ Approval needed for 1-3 Business Day TAT		Commercial "A" = Results only, Commercial "B" = Results + QC Summary Commercial "C" = Results + QC Summary + Raw data		Intact <input type="checkbox"/> Not Intact <input type="checkbox"/> Preserved where applicable <input type="checkbox"/> Absent <input type="checkbox"/> Therm. ID: _____ In Ice <input type="checkbox"/> Cool Temp. °C: <u>2.6</u>	

11/13/20 11:20 AM

Initials: MK2A  
Label Verification: \_\_\_\_\_



5.2  
5



CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehausa

Client / Reporting Information, Project Information, Requested Analysis, Matrix Codes, Turn Around Time, Deliverable, Comments / Special Instructions, Chain of Custody table, and Signature/Date fields.

5.2
5

EHS-A-QAC-0023-02-FORM-Dayton - Standard COC.xlsx



## Report of Analysis

<b>Client Sample ID:</b> SW-B41(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-1	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.49	0.39	mg/kg	1	12/11/20 13:33 RI		SW846 3060A/7196A
Redox Potential Vs H2	296			mv	1	12/08/20 15:00 ER		ASTM D1498-76M
Solids, Percent	81.3			%	1	12/09/20 16:09 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.03 J			su	1	12/08/20 13:00 ER		SW846 9045D

(a) Temp of pH Reading: 24.8 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4



## Report of Analysis

<b>Client Sample ID:</b> SW-B41(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-1R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.65	0.49	0.39	mg/kg	1	12/18/20 12:24 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-4	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.44 J	0.48	0.38	mg/kg	1	12/11/20 13:33 RI		SW846 3060A/7196A
Redox Potential Vs H2	303			mv	1	12/08/20 15:21 ER		ASTM D1498-76M
Solids, Percent	83.3			%	1	12/09/20 16:09 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.32 J			su	1	12/08/20 13:12 ER		SW846 9045D

(a) Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-4R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.51	0.47	0.37	mg/kg	1	12/18/20 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(4.0-4.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-6	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.97	0.45	0.36	mg/kg	1	12/11/20 13:33 RI	SW846	3060A/7196A
Redox Potential Vs H2	304			mv	1	12/08/20 15:27 ER	ASTM	D1498-76M
Solids, Percent	87.5			%	1	12/09/20 16:09 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.05 J			su	1	12/08/20 13:18 ER	SW846	9045D

(a) Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.5  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(4.0-4.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-6R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/18/20 12:24 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-7	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.35	mg/kg	1	12/11/20 13:33 RI	SW846	3060A/7196A
Redox Potential Vs H2	294			mv	1	12/08/20 15:29 ER	ASTM	D1498-76M
Solids, Percent	90.7			%	1	12/09/20 16:09 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.59 J			su	1	12/08/20 13:21 ER	SW846	9045D

(a) Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-7R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0	0.43	0.34	mg/kg	1	12/18/20 12:24 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-8	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/11/20 13:33 RI	SW846	3060A/7196A
Redox Potential Vs H2	307			mv	1	12/08/20 15:40 ER	ASTM	D1498-76M
Solids, Percent	90.5			%	1	12/09/20 16:09 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.12 J			su	1	12/08/20 13:24 ER	SW846	9045D

(a) Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B38(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-8R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.43	0.34	mg/kg	1	12/18/20 12:24	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(2.0-2.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-9	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.80	0.45	0.36	mg/kg	1	12/11/20 13:33 RI	SW846	3060A/7196A
Redox Potential Vs H2	279			mv	1	12/08/20 15:54 ER	ASTM	D1498-76M
Solids, Percent	90.5			%	1	12/09/20 16:09 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.94 J			su	1	12/08/20 13:36 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(2.0-2.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-9R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.43	0.34	mg/kg	1	12/18/20 12:24 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-12	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.43	0.34	mg/kg	1	12/11/20 13:28 RI	SW846	3060A/7196A
Redox Potential Vs H2	292			mv	1	12/08/20 13:29 ER	ASTM D1498-76M	
Solids, Percent	91.1			%	1	12/09/20 16:09 BG	SM2540 G 18TH ED MOD	
pH <sup>a</sup>	8.22 J			su	1	12/08/20 15:13 ER	SW846 9045D	

(a) Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.13  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-12R	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.43	0.34	mg/kg	1	12/18/20 12:20 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(0.0-0.5)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-12RT	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	1.1 J	0.20	0.092	%	1	12/20/20 12:36 MP	MP	ASTM D3872-86
Sulfide Screen <sup>b</sup>	NEGATIVE UJ				1	12/20/20 12:30 MP	MP	SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	68400 J	110	85	mg/kg	1	12/29/20 13:37 BM	BM	LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201207)	<b>Date Sampled:</b> 12/07/20
<b>Lab Sample ID:</b> JD17304-13	<b>Date Received:</b> 12/07/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.16  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/07/20 21:08	EB	SW846 7196A
Redox Potential Vs H2	404			mv	1	12/08/20 11:56	ER	ASTM D1498-76
pH <sup>a</sup>	4.97 J			su	1	12/14/20 10:55	SK	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis. Temp of pH Reading: 8.8 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Miscellaneous Analyses

SDG # JD17438

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39873R  
Review Level: Tier II  
Project: **30065658.0003**



## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17438 for samples collected in association with the PPG Industries Site at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					MISC
MSA-B2627(7.5-8.0)	JD17438-1	Soil	12/09/2020		X
MSA-C2829(13.0-13.5)	JD17438-2	Soil	12/08/2020		X
MSA-BC28(9.8-10.0)	JD17438-3	Soil	12/09/2020		X
MSA-C2829(9.8-10.0)	JD17438-4	Soil	12/08/2020		X
MSA-C2829(11.7-12.0)	JD17438-5	Soil	12/08/2020		X
MSA-C2829(6.5-7.0)	JD17438-6	Soil	12/08/2020		X
FB(20201209)	JD17438-7	Soil	12/09/2020		X

**Notes:**

MISC - Miscellaneous analysis includes Hexavalent Chromium, Sulfide, TOC, Ferrous Iron and pH.

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9045D, ASTM D1498-76M, SM4500S2-A-11 and LLOYD KAHN 1988 MOD. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJ DEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
  - RA The result was rejected due to deficiencies but is considered usable for decision-making purposes.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even

## DATA REVIEW REPORT

if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Soil	21 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

MS analysis was performed on sample ID MSA-B2627(7.5-8.0). Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
MSA-B2627(7.5-8.0)	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but < 75%	Non-detect	UJ-
	Detect	J-

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery < 50%	Non-detect	R/RA
	Detect	R/RA
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected (“R”); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

Consistent with practices on the PPG remediation program, since the source sample used for MS analysis exhibited a reducing environment, both detected and non-detected hexavalent chromium results from the original analysis were determined to be rejected but acceptable for use (“RA” qualifier).

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 50% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

The laboratory duplicate analysis was performed on sample ID MSA-B2627(7.5-8.0). The laboratory duplicate analysis exhibited a RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D	X				X

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SW 846 9045D	Soil	24 hours of receipt at laboratory	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24hours from collection to analysis	Cool to <6 °C
Sulfide SM4500S2- A-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon LLOYD KAHN 1988 MOD	Soil	28 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Method	Holding Time	Criteria
SW-B37(0.0-0.5)	pH by SW 846 9045D	> 6 days	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	20 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	20 days	7 days from collection to analysis
MSA-C2829(13.0-13.5)	pH by SW 846 9045D	6 days	24 hours of receipt at laboratory
MSA-BC28(9.8-10.0)	pH by SW 846 9045D	6 days	24 hours of receipt at laboratory
MSA-C2829(9.8-10.0)	pH by SW 846 9045D	6 days	24 hours of receipt at laboratory
MSA-C2829(11.7-12.0)	pH by SW 846 9045D	6 days	24 hours of receipt at laboratory
MSA-C2829(6.5-7.0)	pH by SW 846 9045D	6 days	24 hours of receipt at laboratory

Sample results associated with sample locations analyzed outside holding time were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.



## DATA REVIEW REPORT

### 3. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of  $\pm$  the RL is applied.

The laboratory duplicate analysis was performed on sample ID MSA-B2627(7.5-8.0) for pH and redox potential. The laboratory duplicate analysis exhibited acceptable RPDs.

### 4. MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS analysis was not performed on samples from this SDG.

### 5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

A field duplicate sample was not collected for the samples from this SDG.

### 6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW 8469045D, ASTM D3872-86, SM4500S2-A-11 and LLOYD KAHN 1988 MOD	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE:



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DATE: January 12, 2021

PEER REVIEW: Rachelle Borne

DATE: January 13, 2021

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





## Report of Analysis

<b>Client Sample ID:</b> MSA-B2627(7.5-8.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-1	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.1  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/16/20 14:35 RI	SW846	3060A/7196A RA
Redox Potential Vs H2	294			mv	1	12/15/20 16:49 ER	ASTM D1498-76M	
Solids, Percent	87.2			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.40 J			su	1	12/15/20 16:15 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2627(7.5-8.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-1R	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.2  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/22/20 11:34 RI	SW846	3060A/7196A RA

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2627(7.5-8.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-1RT	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	2.5 J	0.20	0.092	%	1	12/29/20 09:45 MP		ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>	<del>R</del>			1	12/29/20 09:45 MP		SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	47400	110	89	mg/kg	1	12/29/20 17:18 BM		LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4



## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(13.0-13.5)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-2	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.35	mg/kg	1	12/16/20 14:41 RI	SW846	3060A/7196A
Redox Potential Vs H2	282			mv	1	12/15/20 16:56 ER	ASTM	D1498-76M
Solids, Percent	86.6			%	1	12/14/20 16:42 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	8.54 J			su	1	12/15/20 16:18 ER	SW846	9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(13.0-13.5)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-2R	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.5  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/22/20 11:37 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC28(9.8-10.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-3	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.64	0.46	0.37	mg/kg	1	12/16/20 14:41 RI	SW846	3060A/7196A
Redox Potential Vs H2	286			mv	1	12/15/20 16:59 ER	ASTM	D1498-76M
Solids, Percent	85.1			%	1	12/14/20 16:42 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	8.22 J			su	1	12/15/20 16:21 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.6  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC28(9.8-10.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-3R	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.59	0.46	0.37	mg/kg	1	12/22/20 11:37 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(9.8-10.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-4	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 71.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.55	0.43	mg/kg	1	12/16/20 14:41 RI		SW846 3060A/7196A
Redox Potential Vs H2	253			mv	1	12/15/20 17:06 ER		ASTM D1498-76M
Solids, Percent	71.9			%	1	12/14/20 16:42 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.18 J			su	1	12/15/20 16:33 ER		SW846 9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(9.8-10.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-4R	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 71.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.97	0.55	0.44	mg/kg	1	12/22/20 11:37 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(11.7-12.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-5	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.47	0.37	mg/kg	1	12/16/20 14:41 RI	SW846	3060A/7196A
Redox Potential Vs H2	245			mv	1	12/15/20 17:08 ER	ASTM	D1498-76M
Solids, Percent	84.2			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.43 J			su	1	12/15/20 16:36 ER	SW846	9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(11.7-12.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-5R	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.47	0.37	mg/kg	1	12/22/20 11:37 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(6.5-7.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-6	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.46	0.45	0.35	mg/kg	1	12/16/20 14:41 RI	SW846	3060A/7196A
Redox Potential Vs H2	262			mv	1	12/15/20 17:14 ER	ASTM	D1498-76M
Solids, Percent	88.6			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.14 J			su	1	12/15/20 16:39 ER	SW846	9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2829(6.5-7.0)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-6R	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.13  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.44	0.35	mg/kg	1	12/22/20 11:37 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201209)	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> JD17438-7	<b>Date Received:</b> 12/09/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/09/20 22:20	EB	SW846 7196A
Redox Potential Vs H2	305			mv	1	12/10/20 10:33	ER	ASTM D1498-76
pH <sup>a</sup>	5.14 <span style="color: red; font-size: small;">J</span>			su	1	12/09/20 21:37	RS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis. Temp of pH Reading: 18.9 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.14  
4

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Miscellaneous Analyses

SDG # JD17335

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39874R  
Review Level: Tier II  
Project: **30065658.0003**



## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17335 for samples collected in association with the PPG Industries Site at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					MISC
SW-B39(8.0-8.5)	JD17335-1	Soil	12/08/2020		X
SW-B39(6.0-6.5)	JD17335-2	Soil	12/08/2020		X
SW-B36(4.0-4.5)	JD17335-3	Soil	12/08/2020		X
SW-B37(6.0-6.5)	JD17335-4	Soil	12/08/2020		X
SW-B41(8.0-8.5)	JD17335-5	Soil	12/08/2020		X
SW-B41(6.0-6.5)	JD17335-6	Soil	12/08/2020		X
SW-B38(4.0-4.5)	JD17335-7	Soil	12/08/2020		X
SW-B35(6.0-6.5)	JD17335-8	Soil	12/08/2020		X
SW-B39(2.0-2.5)	JD17335-9	Soil	12/08/2020		X
SW-B39(4.0-4.5)	JD17335-10	Soil	12/08/2020		X
SW-B38(6.0-6.5)	JD17335-12	Soil	12/08/2020		X
SW-B37(4.0-4.5)	JD17335-13	Soil	12/08/2020		X
SW-B37(2.0-2.5)	JD17335-14	Soil	12/08/2020		X
SW-B36(0.0-0.5)	JD17335-15	Soil	12/08/2020		X
SW-B38(8.0-8.5)	JD17335-16	Soil	12/08/2020		X
SW-B36(2.0-2.5)	JD17335-17	Soil	12/08/2020		X
DUP-01(20201208)	JD17335-18	Soil	12/08/2020	SW-B41 (6.0-6.5)	X
FB(20201208)	JD17335-19	Soil	12/08/2020		X

MISC - Miscellaneous analysis includes Hexavalent Chromium, Sulfide, TOC, Ferrous Iron and pH.

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X	X		
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

10. Sample ID and SW-B35(4.0 – 4.5) was listed in chain of custody. But this sample was not analyzed as per communication from project team.

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9045D, ASTM D1498-76M, SM4500S2-A-11 and LLOYD KAHN 1988 MOD. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJ DEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Soil	21 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

MS analysis was performed on sample ID SW-B41(8.0-8.5). Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B41(8.0-8.5)	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but < 75%	Non-detect	UJ-
	Detect	J-



## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but ≤ 150%	Detect	J+
Spike recovery > 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected (“R”); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 50% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of ± the RL is used.

The laboratory duplicate analysis was performed on sample ID SW-B41(8.0-8.5). The laboratory duplicate analysis exhibited a RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-B41 (6.0-6.5) / DUP-01(20201208)	Chromium, Hexavalent	U	U	AC

### Notes:

U = Non-detect  
AC = Acceptable

The calculated difference between the parent sample and field duplicate were acceptable.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 6. System Performance and Overall Assessment

## **DATA REVIEW REPORT**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D	X				X

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SW 846 9045D	Soil	24 hours of receipt at laboratory	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24hours from collection to analysis	Cool to <6 °C
Sulfide SM4500S2- A-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon LLOYD KAHN 1988 MOD	Soil	28 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Method	Holding Time	Criteria
SW-B41(8.0-8.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	21 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	21 days	7 days from collection to analysis
SW-B39(8.0-8.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B39(6.0-6.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B36(4.0-4.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B37(6.0-6.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B41(6.0-6.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B38(4.0-4.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B35(6.0-6.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B39(2.0-2.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B39(4.0-4.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B38(6.0-6.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B37(4.0-4.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B37(2.0-2.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B36(0.0-0.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B38(8.0-8.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
SW-B36(2.0-2.5)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
DUP-01(20201208)	pH by SW 846 9045D	> 24 hours	24 hours of receipt at laboratory
FB(20201208)	pH by SW 846 9045D	> 48 hours	24 hours of receipt at laboratory

Sample results associated with sample locations analyzed outside holding time were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

## DATA REVIEW REPORT

### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

### 3. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of  $\pm$  the RL is applied.

The laboratory duplicate analysis was performed on sample ID SW-B41(8.0-8.5) for sulfide screen and ferrous iron. The laboratory duplicate analysis exhibited acceptable RPDs.

### 4. MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS analysis was performed on sample ID SW-B41(8.0-8.5) for ferrous iron. MS analysis exhibited an acceptable recovery.

### 5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result	Duplicate Result	RPD
SW-B41 (6.0-6.5) / DUP-01(20201208)	pH	7.76	7.84	1.0%

The calculated RPD between the parent sample and field duplicate were acceptable.

## DATA REVIEW REPORT

### 6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW 8469045D, ASTM D3872-86, SM4500S2-A-11 and LLOYD KAHN 1988 MOD	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE:



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DATE: January 12, 2021

PEER REVIEW: Rachelle Borne

DATE: January 13, 2021



**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





SD  
FB

### CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL: 732-329-0200 FAX: 732-329-3499/3480  
www.sgs.com/ehsusa

E

RED-EX Tracking #	Blank Order Control #
SGS Quote #	SGS Job #
	RD 1 - 112520 - 141
	JD 17335

Client / Reporting Information		Project Information		Requested Analysis												Matrix Codes											
Company Name: <b>Arcadis</b>		Project Name: <b>PPG - Site 107</b>														DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment CR - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Waste FB - Field Blank EB - Equipment Blank RB - Rinsed Blank TB - Trip Blank											
Street Address: <b>10 Friends Ln</b>		Street: <b>18 Chapel Ave</b>																									
City, State, Zip: <b>Newton, PA 18940</b>		City, State: <b>Jersey City NJ</b>														LAB USE ONLY <b>B20 GSI</b>											
Project Contact: <b>Jim McLoughlin</b>		Project #: <b>20052582</b>																									
Phone #: <b>(215)-815-1030</b>		Client Purchase Order #:																									
Sample(s) Name(s): <b>J Mateo (20) 893-6662</b>		Project Manager: <b>J McLoughlin</b>																									
SGS Sample #	Field ID / Point of Collection	MEOHDI Val #	Date	Time	Sampled by	QAC (Corp/C)	Matrix	# of bottles	MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS				
1	SW-B335 (8.0-8.5)		12/08/2009	0940	JM	G	S	1																			
2	SW-B335 (6.0-6.5)		12/08/2009	0950	JM	G	S	1																			
3	SW-B336 (4.0-4.5)		12/08/2009	310	JM	G	S	1																			
4	SW-B337 (6.0-6.5)		12/08/2009	1130	JM	G	S	1																			
5	SW-B411 (8.0-8.5)		12/08/2009	0840	JM	G	S	1																			
6	SW-BH1 (0.0-8.5) MS		12/08/2009	0845	JM	G	S	1																			
7	SW-B411 (8.0-8.5) MSD		12/08/2009	0850	JM	G	S	1																			
8	SW-B411 (6.0-6.5)		12/08/2009	0855	JM	G	S	1																			
9	SW-B338 (4.0-4.5)		12/08/2009	1050	JM	G	S	1																			
10	SW-B335 (6.0-6.5)		12/08/2009	11400	JM	G	S	1																			
11	SW-B339 (2.0-2.5)		12/08/2009	11005	JM	G	S	1																			
12	SW-B339 (4.0-4.5)		12/08/2009	11000	JM	G	S	1																			
Turn Around Time (Business Days)		Approved By (SGS PNI) / Date:		Deliverable												Comments / Special Instructions											
<input type="checkbox"/> 10 Business Days <input checked="" type="checkbox"/> 5 Business Days <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 2 Business Days <input type="checkbox"/> 1 Business Day <input type="checkbox"/> Other _____ <small>All data available via Lablink</small>		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NJ Reduced (Level 3) <input checked="" type="checkbox"/> Full Tier 1 (Level 4) <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ DKQP		<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> MA MCP Criteria <input type="checkbox"/> CT RCP Criteria <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format												<input type="checkbox"/> DOD-QSMS  <b>* Use site-specific Node crushing and homogenization procedures</b>											
Approval needed for 1-3 Business Day TAT		Commercial "A" = Results only; Commercial "B" = Results + QC Summary		Commercial "C" = Results + QC Summary + Partial Raw data												http://www.sgs.com/en/terms-and-conditions											
Sample Custody must be documented below each time samples change possession, including courier delivery.																											
Relinquished by:	Date / Time:	Received by:	Date / Time:	Relinquished by:	Date / Time:	Received by:	Date / Time:	Relinquished by:	Date / Time:	Received by:	Date / Time:	Relinquished by:	Date / Time:	Received by:	Date / Time:	Relinquished by:	Date / Time:	Received by:	Date / Time:	Relinquished by:	Date / Time:	Received by:	Date / Time:	Relinquished by:	Date / Time:		
1	12/08/2009 11:53	2	12/08/2009 16:54	3	12/08/2009 16:54	4	12/08/2009 16:54	5	12/08/2009 16:54	6	12/08/2009 16:54	7	12/08/2009 16:54	8	12/08/2009 16:54	9	12/08/2009 16:54	10	12/08/2009 16:54	11	12/08/2009 16:54	12	12/08/2009 16:54	13	12/08/2009 16:54	14	12/08/2009 16:54
Custody #		Intact		Preserved where applicable		Therm ID		On Ice		Cooler Temp. °C																	
10890		<input checked="" type="checkbox"/>		<input type="checkbox"/>				<input type="checkbox"/>		2.66 TP																	

5.2  
5

Initial Assessment MK 3B  
Lab Verification \_\_\_\_\_





CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehusa

FED-EX Tracking #
Bottle Order Control #
SGS Quote # JD17335
SGS Job #

Client / Reporting Information
Company Name: Arcadis
Project Name: PPG - Site 107
Street Address: 10 Friends Ln
City: Newton PA 18940
Project Contact: Jim McLaughlin
Phone: 215-815-1030
Sample(s) Name(s): J. Mateu (00)-893262

Table with columns: Sample #, Field ID / Point of Collection, MECHDI Val #, Date, Time, Sampled By, Sub (cc), Matrix, # of bottles, and various analysis codes (H2O, NH3, HNO3, etc.). Rows 11-21 contain sample data.

Turn Around Time (Business Days)
Approved By (SGS PM) / Date:
Deliverable
Commercial "A" (Level 1)
Commercial "B" (Level 2)
Commercial "C"
NJ DKQP
Comments / Special Instructions: \* USE Site - Specific Nodule crushing and homogenization procedures

Relinquished by: [Signature] Date / Time: 12/08/2010/1531
Received By: [Signature] Date / Time: 12-8-20
Relinquished by: [Signature] Date / Time:
Received By: [Signature] Date / Time:
Relinquished by: [Signature] Date / Time:
Received By: [Signature] Date / Time:
Custody Seal # 10850
On Ice [ ] Cooler Temp. °C 2.6 C IP

5.2
5

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.docx



## Report of Analysis

<b>Client Sample ID:</b> SW-B39(8.0-8.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-1	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	298			mv	1	12/09/20 14:48	ER	ASTM D1498-76M
Solids, Percent	85.7			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.48 J			su	1	12/09/20 15:17	ER	SW846 9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(8.0-8.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-1R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/18/20 16:44	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-2	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.43 J	0.46	0.37	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	269			mv	1	12/09/20 15:15	ER	ASTM D1498-76M
Solids, Percent	87.3			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.40 J			su	1	12/09/20 15:56	ER	SW846 9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-2R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.55	0.46	0.36	mg/kg	1	12/18/20 16:44 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-3	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.5  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.9	0.45	0.36	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	276			mv	1	12/09/20 15:16	ER	ASTM D1498-76M
Solids, Percent	89.5			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.21 J			su	1	12/09/20 15:59	ER	SW846 9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B36(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-3R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	7.0	0.44	0.35	mg/kg	1	12/18/20 16:44	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-4	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/14/20 18:21 EB		SW846 3060A/7196A
Redox Potential Vs H2	279			mv	1	12/09/20 15:18 ER		ASTM D1498-76M
Solids, Percent	85.6			%	1	12/09/20 16:09 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.19 J			su	1	12/09/20 16:02 ER		SW846 9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-4R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2	0.46	0.37	mg/kg	1	12/18/20 16:44	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(8.0-8.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-5	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND <span style="color: red;">UJ</span>	0.48	0.38	mg/kg	1	12/14/20 18:15 EB	SW846	3060A/7196A
Redox Potential Vs H2	324			mv	1	12/09/20 15:20 ER	ASTM D1498-76M	
Solids, Percent	80			%	1	12/09/20 16:09 BG	SM2540 G 18TH ED MOD	
pH <sup>a</sup>	7.75 <span style="color: red;">J</span>			su	1	12/09/20 16:05 ER	SW846	9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(8.0-8.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-5R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.49	0.39	mg/kg	1	12/18/20 16:32 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

Client Sample ID: SW-B41(8.0-8.5)	Date Sampled: 12/08/20
Lab Sample ID: JD17335-5RT	Date Received: 12/08/20
Matrix: SO - Soil	Percent Solids: 80.0
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	0.83 <sup>J</sup>	0.20	0.092	%	1	12/29/20 09:45 MP		ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>		<sup>R</sup>		1	12/29/20 09:45 MP		SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	67900	130	97	mg/kg	1	12/29/20 16:18 BM		LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-6	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.47	0.37	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	289			mv	1	12/09/20 15:21	ER	ASTM D1498-76M
Solids, Percent	85.6			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.76 J			su	1	12/09/20 16:08	ER	SW846 9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-6R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.44 J	0.46	0.36	mg/kg	1	12/18/20 16:44 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B38(4.0-4.5) <b>Lab Sample ID:</b> JD17335-7 <b>Matrix:</b> SO - Soil <b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	<b>Date Sampled:</b> 12/08/20 <b>Date Received:</b> 12/08/20 <b>Percent Solids:</b> 84.7
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4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.37	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	284			mv	1	12/09/20 15:23	ER	ASTM D1498-76M
Solids, Percent	84.7			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.39 J			su	1	12/09/20 16:11	ER	SW846 9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-7R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1	0.46	0.36	mg/kg	1	12/18/20 16:44 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-8	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.16  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.42 J	0.45	0.36	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	284			mv	1	12/09/20 15:25	ER	ASTM D1498-76M
Solids, Percent	88.3			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.88 J			su	1	12/09/20 16:14	ER	SW846 9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-8R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4	0.44	0.35	mg/kg	1	12/18/20 16:44	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(2.0-2.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-9	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.18  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.48	0.38	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	279			mv	1	12/09/20 15:27	ER	ASTM D1498-76M
Solids, Percent	82.6			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.26 J			su	1	12/09/20 16:17	ER	SW846 9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(2.0-2.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-9R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.19  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.93	0.48	0.38	mg/kg	1	12/18/20 16:44 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-10	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.20  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.98	0.46	0.36	mg/kg	1	12/14/20 18:21	EB	SW846 3060A/7196A
Redox Potential Vs H2	294			mv	1	12/09/20 14:52	ER	ASTM D1498-76M
Solids, Percent	88.1			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.34 J			su	1	12/09/20 15:20	ER	SW846 9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-10R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.21  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8	0.44	0.35	mg/kg	1	12/18/20 16:44	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B38(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-12	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.22  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.37	mg/kg	1	12/14/20 18:25 EB	SW846	3060A/7196A
Redox Potential Vs H2	309			mv	1	12/09/20 14:55 ER	ASTM	D1498-76M
Solids, Percent	86.8			%	1	12/09/20 16:09 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.11 J			su	1	12/09/20 15:26 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(6.0-6.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-12R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.23  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.83	0.46	0.36	mg/kg	1	12/18/20 16:44	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-13	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.24  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.43	0.34	mg/kg	1	12/14/20 18:25	EB	SW846 3060A/7196A
Redox Potential Vs H2	314			mv	1	12/09/20 15:00	ER	ASTM D1498-76M
Solids, Percent	90.3			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.02 J			su	1	12/09/20 15:29	ER	SW846 9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(4.0-4.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-13R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.25  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.5	0.44	0.35	mg/kg	1	12/18/20 16:50	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(2.0-2.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-14	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.26  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.5	0.45	0.36	mg/kg	1	12/14/20 18:25	EB	SW846 3060A/7196A
Redox Potential Vs H2	317			mv	1	12/09/20 15:02	ER	ASTM D1498-76M
Solids, Percent	89.2			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.88 J			su	1	12/09/20 15:32	ER	SW846 9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(2.0-2.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-14R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.0	0.44	0.35	mg/kg	1	12/18/20 16:50	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(0.0-0.5) <b>Lab Sample ID:</b> JD17335-15 <b>Matrix:</b> SO - Soil <b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	<b>Date Sampled:</b> 12/08/20 <b>Date Received:</b> 12/08/20 <b>Percent Solids:</b> 91.9
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4.28  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.42	0.34	mg/kg	1	12/14/20 18:25	EB	SW846 3060A/7196A
Redox Potential Vs H2	313			mv	1	12/09/20 15:05	ER	ASTM D1498-76M
Solids, Percent	91.9			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.33 J			su	1	12/09/20 15:35	ER	SW846 9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(0.0-0.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-15R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.29  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.56	0.42	0.33	mg/kg	1	12/18/20 16:50	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B38(8.0-8.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-16	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.30  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.44 J	0.47	0.38	mg/kg	1	12/14/20 18:25	EB	SW846 3060A/7196A
Redox Potential Vs H2	305			mv	1	12/09/20 15:07	ER	ASTM D1498-76M
Solids, Percent	84.1			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.43 J			su	1	12/09/20 15:38	ER	SW846 9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(8.0-8.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-16R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.31  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.1	0.47	0.37	mg/kg	1	12/18/20 16:50 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(2.0-2.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-17	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.32  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.44 J	0.47	0.37	mg/kg	1	12/14/20 18:25 EB	SW846	3060A/7196A
Redox Potential Vs H2	316			mv	1	12/09/20 15:08 ER	ASTM	D1498-76M
Solids, Percent	85			%	1	12/09/20 16:09 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.97 J			su	1	12/09/20 15:50 ER	SW846	9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(2.0-2.5)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-17R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.47	0.37	mg/kg	1	12/18/20 16:50	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> DUP-01(20201208)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-18	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.34  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/14/20 18:25	EB	SW846 3060A/7196A
Redox Potential Vs H2	278			mv	1	12/09/20 15:13	ER	ASTM D1498-76M
Solids, Percent	85.6			%	1	12/09/20 16:09	BG	SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.84 J			su	1	12/09/20 15:53	ER	SW846 9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> DUP-01(20201208)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-18R	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.35  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/18/20 16:50	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201208)	<b>Date Sampled:</b> 12/08/20
<b>Lab Sample ID:</b> JD17335-19	<b>Date Received:</b> 12/08/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/08/20 22:54	EB	SW846 7196A
Redox Potential Vs H2	368			mv	1	12/09/20 10:38	ER	ASTM D1498-76
pH <sup>a</sup>	4.32 J			su	1	12/11/20 09:39	RS	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis. Temp of pH Reading: 12. Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Miscellaneous Analyses

SDG # JD17544

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39875R  
Review Level: Tier II  
Project: **30065658.0003**





## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17544 for samples collected in association with the PPG Industries Site at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					MISC
FB(20201210)	JD17544-1	Soil	12/10/2020		X
MSA-BC26(4.0-4.5)	JD17544-2	Soil	12/10/2020		X
MSA-B2425(3.25-3.75)	JD17544-4	Soil	12/10/2020		X
MSA-B2425(6.0-6.5)	JD17544-5	Soil	12/10/2020		X
MSA-C2425(3.5-4.0)	JD17544-6	Soil	12/10/2020		X
MSA-C2425(5.5-6.0)	JD17544-7	Soil	12/10/2020		X

**Notes:**

MISC - Miscellaneous analysis includes Hexavalent Chromium, Sulfide, TOC, Ferrous Iron and pH.

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X	X		
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

10. Sample ID MSA-B2425(2.75-3.25) was listed in chain of custody. But this sample was not analyzed as per communication from project team.

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9045D, ASTM D1498-76M, SM4500S2-A-11 and LLOYD KAHN 1988 MOD. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJ DEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Soil	21 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

MS analysis was performed on sample IDs MSA-BC26(4.0-4.5) and MSA-B2425(3.25-.3.75). Samples associated with the MS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
MSA-BC26(4.0-4.5)	Hexavalent Chromium, Soluble	< 50%	-
MSA-B2425(3.25-3.75)	Hexavalent Chromium, Soluble	< 50%	-

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but $<$ 75%	Non-detect	UJ-
	Detect	J-
Spike recovery $<$ 50%	Non-detect	R
	Detect	R
Spike recovery $>$ 125%	Non-detect	No Action
Spike recovery $>$ 125% but $\leq$ 150%	Detect	J+
Spike recovery $>$ 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are  $<$  50% or  $>$  150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the  $<$  50% or  $>$  150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 50% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis was performed on sample IDs MSA-B2425(3.25-3.75) and MSA-BC26(4.0-4.5). The laboratory duplicate analysis exhibited a RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A filed duplicate sample was not collected for the samples from this SDG.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D	X				X

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SW 846 9045D	Soil	24 hours of receipt at laboratory	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24hours from collection to analysis	Cool to <6 °C
Sulfide SM4500S2- A-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon LLOYD KAHN 1988 MOD	Soil	28 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Method	Holding Time	Criteria
MSA-B2425(3.25-3.75)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	20 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	20 days	7 days from collection to analysis
FB(20201210)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory
MSA-BC26(4.0-4.5)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory
MSA-B2425(3.25-3.75)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory
MSA-B2425(6.0-6.5)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory
MSA-C2425(3.5-4.0)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory
MSA-C2425(5.5-6.0)	pH by SW 846 9045D	9 days	24 hours of receipt at laboratory

Sample results associated with sample locations analyzed outside holding time were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

## DATA REVIEW REPORT

### 3. Laboratory Duplicate Analysis

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of  $\pm$  the RL is applied.

The laboratory duplicate analysis was performed on sample ID MSA-BC26(4.0-4.5) for pH. The laboratory duplicate analysis exhibited an acceptable RPD.

### 4. MS/MSD Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS analysis was not performed on samples from this SDG.

### 5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for the samples from this SDG.

### 6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.



## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW 8469045D, ASTM D3872-86, SM4500S2-A-11 and LLOYD KAHN 1988 MOD	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

**Notes:**

%R     Percent recovery

RPD     Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE:



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DATE: January 13, 2021

PEER REVIEW: Rachelle Borne

DATE: January 13, 2021

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**



E  
P/W  
CRUST  
HOMOGENIZE

Client / Reporting Information		Project Information		Requested Analysis										Matrix Codes			
Company Name: <b>Arcadis</b>		Project Name: <b>PPG - site 107</b>		<p style="text-align: center;">GVI (inc &amp; PH) COPR Nodes</p>										DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Waste FB - Feed Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank			
Street Address: <b>10 Friends Ln</b>		Street: <b>18 Chapel Ave</b>															
City, State, Zip: <b>Newtown, PA 16940</b>		City, State, Zip: <b>Trenton, NJ</b>															
Project Contact: <b>Tim McLaughlin</b>		Project #: <b>30065688 20600</b>															
Phone #: <b>215-515-1030</b>		Client Purchase Order #:															
Sampler(s) Name(s): <b>Christina Cigelli</b>		Project Manager: <b>J. McLaughlin</b>		Number of preserved Bottles										LAB USE ONLY			
SGS Sample #	Field ID / Point of Collection	MEQ/MDI Vol #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HD	NH3	HNO3	H2SO4	NONE	DI Water	MEDIA	EMULSION	
1	FB(2020 1210)		12/10/20	0830	CL	G	PB	2					X				
2	MSA-8C26(4.6-4.5)		12/10/20	1030	CG	G	S	2					X				
3	MSA-BA4(2.5(2X-3.25)		12/10/20	1300	CC	G	S	2					X				
4	MSA-B2425(3.25-3.75)		12/10/20	1125	CC	G	S	2					X				
5	MSA-B2425(6.0-6.5)		12/10/20	1130	CC	G	S	2					X				
6	MSA-C2425(3.5-4.0)		12/10/20	1440	CC	G	S	2					X				
7	MSA-C2415(5.5-6.0)		12/10/20	1450	CC	G	S	2					X				
Turn Around Time (Business Days)		Approved By (SGS PM) / Date:		Deliverable										Comments / Special Instructions			
<input type="checkbox"/> 10 Business Days <input checked="" type="checkbox"/> 5 Business Days <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 2 Business Days <input type="checkbox"/> 1 Business Day <input type="checkbox"/> Other		Approval needed for 1-3 Business Day TAT		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NJ Reduced (Level 3) <input checked="" type="checkbox"/> Full Tier 1 (Level 4) <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ DKGP										<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> MA MCP Criteria <input type="checkbox"/> CT RCP Criteria <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format	<input type="checkbox"/> DOD-QSMS * Use site-specific module crushing and homogenization procedure - 3 is 12:00 <a href="http://www.sgs.com/en/terms-and-conditions">http://www.sgs.com/en/terms-and-conditions</a>		
Sample Custody must be documented below each time samples change possession, including courier delivery.																	
Relinquished by:	Date / Time:	Received By:	Date / Time:	Relinquished by:	Date / Time:	Received By:	Date / Time:	Relinquished by:	Date / Time:	Received By:	Date / Time:	Relinquished by:	Date / Time:	Received By:	Date / Time:	Relinquished by:	Date / Time:
1	12/10/20 1530	J. McLaughlin	12/10/20	2	12/10/20	J. McLaughlin	12/10/20	3	12/10/20	J. McLaughlin	12/10/20	4	12/10/20	J. McLaughlin	12/10/20	5	12/10/20
Complete Seal # <input type="checkbox"/> Intact Preserved where applicable Therm. ID <input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp. °C																	

5.2  
5

## Report of Analysis

<b>Client Sample ID:</b> FB(20201210)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-1	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/10/20 22:42	EB	SW846 7196A
Redox Potential Vs H2	401			mv	1	12/11/20 10:23	ER	ASTM D1498-76
pH <sup>a</sup>	4.35 J			su	1	12/15/20 10:32	DG	SM4500H+ B-11

(a) Sample received out of holding time for pH analysis. Temp of pH Reading: 6. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC26(4.0-4.5)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-2	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND <span style="color: red;">UJ</span>	0.46	0.37	mg/kg	1	12/21/20 10:40 RI	SW846	3060A/7196A
Redox Potential Vs H2	306			mv	1	12/19/20 16:50 ER	ASTM	D1498-76M
Solids, Percent	87			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.43 <span style="color: red;">J</span>			su	1	12/19/20 16:44 ER	SW846	9045D

(a) Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC26(4.0-4.5)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-2R	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.47	0.37	mg/kg	1	12/29/20 11:23 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2425(3.25-3.75)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-4	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND <span style="color: red;">UJ</span>	0.47	0.37	mg/kg	1	12/21/20 10:44 RI	SW846	3060A/7196A
Redox Potential Vs H2	307			mv	1	12/19/20 16:51 ER	ASTM	D1498-76M
Solids, Percent	86.3			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.86 <span style="color: red;">J</span>			su	1	12/19/20 16:47 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4



## Report of Analysis

<b>Client Sample ID:</b> MSA-B2425(3.25-3.75)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-4R	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.5  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.41 J	0.46	0.37	mg/kg	1	12/29/20 11:20	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2425(3.25-3.75)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-4RT	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	1.1 J	0.20	0.092	%	1	12/30/20 13:00 MP		ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>	<del>R</del>			1	12/30/20 13:00 MP		SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	38900	120	90	mg/kg	1	01/05/21 17:39 BM		LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.6  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2425(6.0-6.5)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-5	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	6.0	0.44	0.35	mg/kg	1	12/21/20 10:44 RI	SW846	3060A/7196A
Redox Potential Vs H2	310			mv	1	12/19/20 16:56 ER	ASTM D1498-76M	
Solids, Percent	89.7			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.32 J			su	1	12/19/20 16:50 ER	SW846	9045D

(a) Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2425(6.0-6.5)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-5R	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.5	0.44	0.35	mg/kg	1	12/29/20 11:23	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2425(3.5-4.0)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-6	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 78.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.8	0.50	0.40	mg/kg	1	12/21/20 10:44 RI	SW846	3060A/7196A
Redox Potential Vs H2	300			mv	1	12/19/20 17:05 ER	ASTM D1498-76M	
Solids, Percent	78.3			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.28 J			su	1	12/19/20 16:53 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.9  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2425(3.5-4.0)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-6R	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 78.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	7.1	0.50	0.40	mg/kg	1	12/29/20 11:23 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2425(5.5-6.0)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-7	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.44	0.44	0.35	mg/kg	1	12/21/20 10:44 RI	SW846	3060A/7196A
Redox Potential Vs H2	293			mv	1	12/19/20 17:08 ER	ASTM	D1498-76M
Solids, Percent	91.8			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.66 J			su	1	12/19/20 16:56 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2425(5.5-6.0)	<b>Date Sampled:</b> 12/10/20
<b>Lab Sample ID:</b> JD17544-7R	<b>Date Received:</b> 12/10/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.67	0.44	0.35	mg/kg	1	12/29/20 11:23	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Miscellaneous Analyses

SDG # JD17650

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39876R  
Review Level: Tier II  
Project: **30065658.0003**



## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17650 for samples collected in association with the PPG Industries Site at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					MISC
FB(20201211)	JD17650-1	Soil	12/11/2020		X
SW-B40(8.0-8.5)	JD17650-2	Soil	12/11/2020		X
SW-B40(10.0-10.5)	JD17650-3	Soil	12/11/2020		X
MSA-BC30(2.75-3.25)	JD17650-4	Soil	12/11/2020		X
SW-B41(9.0-9.5)	JD17650-5	Soil	12/11/2020		X
SW-B35(0.0-0.5)	JD17650-6	Soil	12/11/2020		X
SW-B35(2.0-2.5)	JD17650-7	Soil	12/11/2020		X
SW-B35(4.0-4.5)	JD17650-8	Soil	12/11/2020		X
SW-B40(2.0-2.5)	JD17650-9	Soil	12/11/2020		X
SW-B41(2.0-2.5)	JD17650-10	Soil	12/11/2020		X
SW-B41(4.0-4.5)	JD17650-11	Soil	12/11/2020		X

**Notes:**

MISC - Miscellaneous analysis includes Hexavalent Chromium, Sulfide, TOC, Ferrous Iron and pH.

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9045D, ASTM D1498-76M, SM4500S2-A-11 and LLOYD KAHN 1988 MOD. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJ DEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Soil	21 days from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Post-Digestion Spike (PDS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

MS analysis was performed on sample IDs MSA-BC30(2.75-3.25) and SW-B35(0.0-0.5). Samples associated with the MS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
MSA-BC30(2.75-3.25)	Hexavalent Chromium, Soluble	< 50%	< 50%
SW-B35(0.0-0.5)	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but $<$ 75%	Non-detect	UJ-
	Detect	J-
Spike recovery $<$ 50%	Non-detect	R
	Detect	R
Spike recovery $>$ 125%	Non-detect	No Action
Spike recovery $>$ 125% but $\leq$ 150%	Detect	J+
Spike recovery $>$ 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are  $<$  50% or  $>$  150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the  $<$  50% or  $>$  150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 50% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis was performed on sample IDs MSA-BC30(2.75-3.25) and SW-B35(0.0-0.5). The laboratory duplicate analysis exhibited a RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for the samples from this SDG.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D	X				X

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SW 846 9045D	Soil	24 hours of receipt at laboratory	Cool to <6°C
Ferrous Iron by ASTM D3872-86	Soil	24hours from collection to analysis	Cool to <6 °C
Sulfide SM4500S2- A-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon LLOYD KAHN 1988 MOD	Soil	28 days from collection to analysis	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Method	Holding Time	Criteria
MSA-BC30(2.75-3.25)	pH by SW 846 9045D	8 days	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	19 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	19 days	7 days from collection to analysis
SW-B35(0.0-0.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
	Ferrous Iron by ASTM D3872-86	18 days	24 hours of receipt at laboratory
	Sulfide SM4500S2- A-11	18 days	7 days from collection to analysis
FB(20201211)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B40(8.0-8.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B40(10.0-10.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B41(9.0-9.5)	pH by SW 846 9045D	8 days	24 hours of receipt at laboratory
SW-B35(2.0-2.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B35(4.0-4.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B40(2.0-2.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B41(2.0-2.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory
SW-B41(4.0-4.5)	pH by SW 846 9045D	4 days	24 hours of receipt at laboratory

Sample results associated with sample locations analyzed outside holding time were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.



## **DATA REVIEW REPORT**

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore detected sample results were not associated with blank contamination.

### **3. Laboratory Duplicate Analysis**

Laboratory duplicate data are used to assess the precision of the analytical method. The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of  $\pm$  the RL is applied.

The laboratory duplicate analysis was performed on sample ID SW-B41(9.0-9.5) for the total organic carbon and samples FB(20201211) and SW-B40(8.0-8.5) for pH. The laboratory duplicate analysis exhibited acceptable RPDs.

### **4. MS/MSD Analysis**

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. In instance where this is true, the data will not be qualified even if the percent recovery does not meet the control limits and the laboratory flag will be removed.

MS analysis was performed on sample ID MSA-BC30(2.75-3.25) for total organic carbon. The MS analysis exhibited an acceptable RPD.

### **5. Field Duplicate Analysis**

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for the samples from this SDG.

### **6. Laboratory Control Sample (LCS) Analysis**

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### **7. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW 8469045D, ASTM D3872-86, SM4500S2-A-11 and LLOYD KAHN 1988 MOD	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

**Notes:**

%R     Percent recovery

RPD     Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE:



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DATE: January 13, 2021

PEER REVIEW: Rachelle Borne

DATE: January 13, 2021

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**







CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsausa

FED-EX Tracking #
SGS Quote #
Bottle Order Control #
SGS Job # JD17650

Client / Reporting Information, Project Information, Requested Analysis, Matrix Codes, Turn Around Time, Deliverable, Comments / Special Instructions, Relinquished By, Date / Time, Received By, Date / Time, Custody Seal #, Intact, Preserved when applicable, Dry Ice, Cooler Temp. C

5.2
5



## Report of Analysis

<b>Client Sample ID:</b> FB(20201211)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-1	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/11/20 22:15	EB	SW846 7196A
Redox Potential Vs H2	401			mv	1	12/15/20 12:27	ER	ASTM D1498-76
pH <sup>a</sup>	7.79 J			su	1	12/15/20 12:41	ER	SM4500H+ B-11

(a) Field analysis required. Received out of hold time and analyzed by request. Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(8.0-8.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-2	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.4	0.47	0.37	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	288			mv	1	12/15/20 12:55 ER	ASTM D1498-76M	
Solids, Percent	82.5			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.30 J			su	1	12/15/20 12:41 ER	SW846	9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.2  
4



## Report of Analysis

<b>Client Sample ID:</b> SW-B40(8.0-8.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-2R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3	0.47	0.38	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(10.0-10.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-3	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.62	0.50	0.40	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	332			mv	1	12/15/20 13:56 ER	ASTM	D1498-76M
Solids, Percent	82.9			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.47 J			su	1	12/15/20 12:29 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(10.0-10.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-3R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.93	0.47	0.37	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC30(2.75-3.25)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-4	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.6  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND <span style="color: red;">UJ</span>	0.45	0.36	mg/kg	1	12/21/20 12:07 RI	SW846	3060A/7196A
Redox Potential Vs H2	297			mv	1	12/19/20 17:11 ER	ASTM	D1498-76M
Solids, Percent	89.3			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.40 <span style="color: red;">J</span>			su	1	12/19/20 16:59 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC30(2.75-3.25)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-4T	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.44	0.35	mg/kg	1	12/29/20 13:30 SH	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-BC30(2.75-3.25)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-4TU	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	1.1 J	0.20	0.092	%	1	12/30/20 13:00 MP		ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>	<del>R</del>			1	12/30/20 13:00 MP		SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	40900	110	87	mg/kg	1	01/05/21 18:45 BM		LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(9.0-9.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-5	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.48	0.38	mg/kg	1	12/21/20 12:08 RI	SW846	3060A/7196A
Redox Potential Vs H2	327			mv	1	12/19/20 17:15 ER	ASTM D1498-76M	
Solids, Percent	80.6			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.80 J			su	1	12/19/20 17:02 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(9.0-9.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-5T	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.7	0.48	0.38	mg/kg	1	12/29/20 13:32 SH	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B35(0.0-0.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-6	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	14.3 J	0.43	0.34	mg/kg	1	12/15/20 11:50 RI	SW846	3060A/7196A
Redox Potential Vs H2	339			mv	1	12/15/20 14:07 ER	ASTM D1498-76M	
Solids, Percent	91.3			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.21 J			su	1	12/15/20 12:26 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(0.0-0.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-6R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	26.7 J	0.44	0.35	mg/kg	1	12/21/20 16:19 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(0.0-0.5) <b>Lab Sample ID:</b> JD17650-6RU <b>Matrix:</b> SO - Soil <b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	<b>Date Sampled:</b> 12/11/20 <b>Date Received:</b> 12/11/20 <b>Percent Solids:</b> 91.3
--	--

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	0.42 J	0.20	0.092	%	1	12/29/20 09:45 MP		ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>	R			1	12/29/20 09:45 MP		SM4500S2- A-11
Total Organic Carbon <sup>c</sup>	69400	110	85	mg/kg	1	12/29/20 18:26 BM		LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.13  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(2.0-2.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-7	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	17.4	0.43	0.34	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	342			mv	1	12/15/20 14:09 ER	ASTM	D1498-76M
Solids, Percent	92.2			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.14 J			su	1	12/15/20 12:23 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(2.0-2.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-7R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 92.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	17.0	0.43	0.34	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(4.0-4.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-8	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.16  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	10.1	0.46	0.37	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	339			mv	1	12/15/20 14:15 ER	ASTM	D1498-76M
Solids, Percent	89.1			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.33 J			su	1	12/15/20 12:20 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(4.0-4.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-8R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	25.9	0.45	0.36	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.17  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(2.0-2.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-9	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.18  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.46	0.36	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	330			mv	1	12/15/20 14:17 ER	ASTM	D1498-76M
Solids, Percent	89			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.16 J			su	1	12/15/20 12:17 ER	SW846	9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B40(2.0-2.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-9R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	8.1	0.44	0.35	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.19  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(2.0-2.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-10	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.20  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.66	0.48	0.38	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	317			mv	1	12/15/20 12:49 ER	ASTM	D1498-76M
Solids, Percent	86			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.72 J			su	1	12/15/20 12:47 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(2.0-2.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-10R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 86.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.21  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.36	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(4.0-4.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-11	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.22  
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### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/15/20 11:58 RI	SW846	3060A/7196A
Redox Potential Vs H2	333			mv	1	12/15/20 12:52 ER	ASTM	D1498-76M
Solids, Percent	87.5			%	1	12/14/20 16:42 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.66 J			su	1	12/15/20 12:44 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B41(4.0-4.5)	<b>Date Sampled:</b> 12/11/20
<b>Lab Sample ID:</b> JD17650-11R	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.23  
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### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.51	0.46	0.36	mg/kg	1	12/21/20 16:25	RI	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Metals and Miscellaneous Analyses

SDG # JD17729

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey and Orlando, FL

Report #39877R  
Review Level: Tier II  
Project: 30065658.003

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## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17729 for samples collected in association with the PPG Site 107 at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					MET	MISC
MSA-B2122(3.25-3.75)	JD17729-1	Soil	12/14/2020		X	X
MSA-B2122(3.25-3.75)	JD17729-1R	Soil	12/14/2020		X	
MSA-B2122(3.25-3.75)	JD17729-1RT	Soil	12/14/2020			X
DUP (20201214)	JD17729-2	Soil	12/14/2020	MSA-C2223(5.0-5.5)	X	X
DUP (20201214)	JD17729-2R	Soil	12/14/2020	MSA-C2223(5.0-5.5)	X	
MSA-B2223(4.0-4.5)	JD17729-3	Soil	12/14/2020		X	X
MSA-B2223(4.0-4.5)	JD17729-3R	Soil	12/14/2020		X	
MSA-B2122(6.0-6.5)	JD17729-4	Soil	12/14/2020		X	X
MSA-B2122(6.0-6.5)	JD17729-4R	Soil	12/14/2020		X	
MSA-B2223(3.0-3.5)	JD17729-5	Soil	12/14/2020		X	X
MSA-B2223(3.0-3.5)	JD17729-5R	Soil	12/14/2020		X	
MSA-C2223(5.0-5.5)	JD17729-6	Soil	12/14/2020		X	X
MSA-C2223(5.0-5.5)	JD17729-6R	Soil	12/14/2020		X	
MSA-C2223(4.0-4.5)	JD17729-7	Soil	12/14/2020		X	X
MSA-C2223(4.0-4.5)	JD17729-7R	Soil	12/14/2020		X	
FB (20201204)	JD17729-10	Soil	12/14/2020		X	X

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance



## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9056A, ASTM D1498-76, EPS 300/SW846 9056A, SM4500S2-F-11, , SM5310 B-11 and SM4500H+ B-11. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJDEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
  - RA The result was rejected due to deficiencies but is considered usable for decision-making purposes.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on

## **DATA REVIEW REPORT**

data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

The MS analysis performed on sample MSA-B2122(3.25-3.75).

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B43 (6.0-6.5)	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but $<$ 75%	Non-detect	UJ-
	Detect	J-
Spike recovery $<$ 50%	Non-detect	R/RA
	Detect	R/RA
Spike recovery $>$ 125%	Non-detect	No Action
Spike recovery $>$ 125% but $\leq$ 150%	Detect	J+
Spike recovery $>$ 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are  $<$  50% or  $>$  150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the  $<$  50% or  $>$  150% limits.

Consistent with practices on the PPG remediation program, since the source sample used for MS analysis exhibited a reducing environment, both detected and non-detected hexavalent chromium results from the original analysis were determined to be rejected but acceptable for use ("RA" qualifier).

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis performed on sample MSA-B2122(3.25-3.75) exhibited RPDs within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD
MSA-C2223(5.0-5.5) / DUP(20201214)	Chromium, Hexavalent	U	1.2	AC

The RPD between parent and duplicate sample was acceptable.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

## DATA REVIEW REPORT

### 8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

# DATA REVIEW REPORT

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Soil	Not applicable	Cool to <6°C
Sulfide by SM4500S2-F-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by SM5310B-11	Soil	28 days from collection to analysis	Cool to <6°C
Iron, Ferrous by ASTM D3872-86	Soil	24 hours of receipt at laboratory	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Holding Time	Criteria
MSA-B2122(3.25-3.75) DUP(20201214) MSA-B2223(4.0-4.5) MSA-B2122(6.0-6.5) MSA-B2223(3.0-3.5) MSA-C2223(5.0-5.5) MSA-C2223(4.0-4.5) FB(20201204)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
MSA-B2122(3.25-3.75)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
MSA-B2122(3.25-3.75)	7 days from collection to analysis	Analysis completed greater than two times holding time

Sample results associated with sample locations analyzed by analytical method pH by SM4500H+B, SM4500S2-F-11 and ASTM D3872-86 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

## DATA REVIEW REPORT

### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

### 3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

MS/MSD analysis was not performed on any of the samples from this SDG.

#### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices.

The laboratory duplicate analysis performed on samples MSA-B2122(3.25-3.75) and FB(20201204) for redox and pH and on sample MSA-B2223(3.0-3.5) for solids, percent, exhibited acceptable RPDs.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (ug/l)	Duplicate Result (ug/l)	RPD
MSA-C2223(5.0-5.5) / DUP(20201214)	Redox Potential Vs H2	292	338	15 %
	Solids, Percent	85.9	83.4	3 %
	pH	8.73	8.91	2 %

The RPDs between parent and duplicate sample were acceptable.



## DATA REVIEW REPORT

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential and pH were not reported in the analytical report.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SM4500S2-F-11, SM4500S2-F-11 and SM5310B-11	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:



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DATE: January 12, 2020

PEER REVIEW: Rachelle Borne

DATE: January 13, 2020

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





## DATA OF KNOWN QUALITY CONFORMANCE/NON-CONFORMANCE SUMMARY QUESTIONNAIRE

**Laboratory Name:** Accutest, Dayton, NJ

**Client:** Arcadis

**Project Location:** PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

**Project Number:** AGMPAL77493

**Sampling Dates:** 12/14/2020

**Laboratory Sample ID(s):** JD17729-1, JD17729-2, JD17729-3, JD17729-4, JD17729-5, JD17729-6, JD17729-7, JD17729-10, JD17729-1R, JD17729-2R, JD17729-3R, JD17729-4R, JD17729-5R, JD17729-6R, JD17729-7R, JD17729-1RT

**Methods Used:** ASTM D1498-76M, SM2540 G 18TH ED MOD, SW846 3060A/7196A, SW846 9045D, SW846 7196A, SM4500H+ B-11, LLOYD KAHN 1988 MOD, SM4500S2- A-11, ASTM D3872-86

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1A	Were the method specified handling, preservation, and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1B	EPH Method: Was the EPH method conducted without significant modifications (see Section 11.3 of respective DKQ methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Were samples received at an appropriate temperature (4+/- 2 Deg C)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
4	Were all QA/QC performance criteria specified in NJDEP DKQP standards achieved? See section 5.7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	a) Were Reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt? b) Were these limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6	For each analytical method referenced in this laboratory report package, were result reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Notes:** For all questions to which the response was "No" (with the exception of question #7) see the Case Narrative in the technical report for additional information. If the answer to question #1, #1A or #1B is "No", the data package does not meet the requirements for "Data of Known Quality"

Generated by vickyp on 01/06/2021 12:44

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2122(3.25-3.75)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-1	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.49	0.39	mg/kg	1	12/23/20 11:59 RI	SW846	3060A/7196A RA
Redox Potential Vs H2	222			mv	1	12/22/20 15:13 ER	ASTM D1498-76M	
Solids, Percent	80.5			%	1	12/22/20 11:45 RI	SM2540 G 18TH ED MOD	
pH <sup>a</sup>	7.22 J			su	1	12/22/20 15:07 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2122(3.25-3.75)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-1R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.48	0.38	mg/kg	1	12/31/20 14:06	JOO	SW846 3060A/7196A RA

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.2  
4



## Report of Analysis

<b>Client Sample ID:</b> MSA-B2122(3.25-3.75)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-1RT	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	1.5 J	0.20	0.092	%	1	01/05/21 13:24 MP	ASTM	D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>01/05/21 13:24 MP</del>	<del>SM4500S2-A-11</del>	<del>R</del>
Total Organic Carbon <sup>c</sup>	30800	120	96	mg/kg	1	01/05/21 23:32 BM	LLOYD KAHN	1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> DUP(20201214)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-2	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.7	0.46	0.37	mg/kg	1	12/23/20 12:03 RI	SW846	3060A/7196A
Redox Potential Vs H2	190			mv	1	12/22/20 15:15 ER	ASTM	D1498-76M
Solids, Percent	83.4			%	1	12/22/20 11:45 RI	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.91 J			su	1	12/22/20 15:10 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> DUP(20201214)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-2R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.5  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	ND	0.47	0.37	mg/kg	1	12/31/20 14:06 JOO SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2223(4.0-4.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-3	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.6  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.5	0.47	0.37	mg/kg	1	12/23/20 12:03 RI	SW846	3060A/7196A
Redox Potential Vs H2	220			mv	1	12/22/20 15:19 ER	ASTM D1498-76M	
Solids, Percent	84.7			%	1	12/22/20 11:45 RI	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.23 J			su	1	12/22/20 15:13 ER	SW846	9045D

(a) Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2223(4.0-4.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-3R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.47	0.37	mg/kg	1	12/31/20 14:06	JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2122(6.0-6.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-4	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 74.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.52	0.41	mg/kg	1	12/23/20 12:03 RI	SW846	3060A/7196A
Redox Potential Vs H2	214			mv	1	12/22/20 15:24 ER	ASTM D1498-76M	
Solids, Percent	74.7			%	1	12/22/20 11:45 RI	SM2540 G 18TH ED MOD	
pH <sup>a</sup>	7.78 J			su	1	12/22/20 15:16 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2122(6.0-6.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-4R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 74.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	ND	0.52	0.41	mg/kg	1	12/31/20 14:06 JOO SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-B2223(3.0-3.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-5	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.42 J	0.47	0.37	mg/kg	1	12/23/20 12:03 RI	SW846	3060A/7196A
Redox Potential Vs H2	241			mv	1	12/22/20 15:29 ER	ASTM	D1498-76M
Solids, Percent	84.6			%	1	12/22/20 11:45 RI	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.24 J			su	1	12/22/20 15:19 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> MSA-B2223(3.0-3.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-5R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.46	0.37	mg/kg	1	12/31/20 14:06	JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2223(5.0-5.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-6	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.5	0.46	0.36	mg/kg	1	12/23/20 12:03 RI	SW846	3060A/7196A
Redox Potential Vs H2	240			mv	1	12/22/20 15:31 ER	ASTM	D1498-76M
Solids, Percent	85.9			%	1	12/22/20 11:45 RI	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.73 J			su	1	12/22/20 15:22 ER	SW846	9045D

(a) Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2223(5.0-5.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-6R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.13  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	1.2	0.46	0.37	mg/kg	1	12/31/20 14:06 JOO SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2223(4.0-4.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-7	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.59	0.47	0.37	mg/kg	1	12/23/20 12:03 RI	SW846	3060A/7196A
Redox Potential Vs H2	231			mv	1	12/22/20 15:35 ER	ASTM	D1498-76M
Solids, Percent	83.6			%	1	12/22/20 11:45 RI	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.64 J			su	1	12/22/20 15:25 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2223(4.0-4.5)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-7R	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.15  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By	Method
Chromium, Hexavalent	ND	0.46	0.37	mg/kg	1	12/31/20 14:06 JOO	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201204)	<b>Date Sampled:</b> 12/14/20
<b>Lab Sample ID:</b> JD17729-10	<b>Date Received:</b> 12/14/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/14/20 22:09	EB	SW846 7196A
Redox Potential Vs H2	414			mv	1	12/18/20 15:10	ER	ASTM D1498-76
pH <sup>a</sup>	6.35 <sub>J</sub>			su	1	12/18/20 15:00	ER	SM4500H+ B-11

(a) Field analysis required. Received out of hold time and analyzed by request. Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Metals and Miscellaneous Analyses

SDG # JD17885

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey.

Report # 39878R  
Review Level: Tier II  
Project: 30065658.003

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## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17885 for samples collected in association with the PPG Site 107 at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					MET	MISC
SW-B40(7.5-8.0)	JD17885-2	Soil	12/15/2020		X	X
SW-B40(12.0-12.5)	JD17885-3	Soil	12/15/2020		X	X
SW-B40(14.0-14.5)	JD17885-4	Soil	12/15/2020		X	X
MSA-C2122(12.0-12.5)	JD17885-5	Soil	12/15/2020		X	X
MSA-C2122(12.0-12.5)	JD17885-5R	Soil	12/15/2020		X	X
MSA-C2122(12.0-12.5)	JD17885-5RT	Soil	12/15/2020		X	X
DUP03(20201215)	JD17885-6	Soil	12/15/2020	SW-B40 (6.0-6.5)	X	X
SW-B39(16.0-16.5)	JD17885-7	Soil	12/15/2020		X	X
SW-B31(6.5-7.0)	JD17885-8	Soil	12/16/2020		X	X
SW-B32(8.5-9.0)	JD17885-9	Soil	12/16/2020		X	X
SW-B31(4.5-5.0)	JD17885-10	Soil	12/16/2020		X	X
SW-B32(6.5-7.0)	JD17885-11	Soil	12/16/2020		X	X
SW-B39(11.0-11.5)	JD17885-12	Soil	12/16/2020		X	X
FB(20201216)	JD17885-13	Soil	12/16/2020		X	X
SW-B39(15.5-16.0)	JD17885-14	Soil	12/16/2020		X	X
SW-B39(13.0-13.5)	JD17885-15	Soil	12/16/2020		X	X
SW-B39(13.0-13.5)	JD17885-15R	Soil	12/16/2020		X	X



## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9056A, ASTM D1498-76, EPS 300/SW846 9056A, SM4500S2-F-11, SM5310 B-11 and SM4500H+ B-11. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJDEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

## DATA REVIEW REPORT

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

The MS analysis performed on sample IDs SW-B40(7.5-8.0) exhibited an acceptable recovery.

Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
MSA-C2122(12.0-12.5)	Hexavalent Chromium, Soluble	< 50%	AC

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but $\leq$ 150%	Detect	J+
Spike recovery > 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis performed on sample IDs SW-B40(7.5-8.0) and MSA-C2122(12.0-12.5) exhibited RPDs within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD
SW-B40(7.5-8.0) / DUP03(20201215)	Chromium, Hexavalent	0.65	U	AC

The RPD between the parent and duplicate sample was acceptable.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

## DATA REVIEW REPORT

The LCS analysis exhibited recoveries within the control limits.

### **8. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

# DATA REVIEW REPORT

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Soil	Not applicable	Cool to <6°C
Sulfide by SM4500S2-F-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by SM5310B-11	Soil	28 days from collection to analysis	Cool to <6°C
Iron, Ferrous by ASTM D3872-86	Soil	24 hours of receipt at laboratory	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Holding Time	Criteria
SW-B40(7.5-8.0) SW-B40(12.0-12.5) SW-B40(14.0-14.5) MSA-C2122(12.0-12.5) DUP03(20201215) SW-B39(16.0-16.5) SW-B31(6.5-7.0) SW-B32(8.5-9.0) SW-B31(4.5-5.0) SW-B32(6.5-7.0) SW-B39(11.0-11.5) FB(20201216)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
MSA-C2122(12.0-12.5)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
MSA-C2122(12.0-12.5)	7 days from collection to analysis	Analysis completed greater than two times holding time

Sample results associated with sample locations analyzed by analytical method pH by SM4500H+B, SM4500S2-F-11 and ASTM D3872-86 were qualified, as specified in the table below. All other holding times were met.



## DATA REVIEW REPORT

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

### 3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

MS/MSD analysis was not performed on any of the samples from this SDG.

#### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices.

The laboratory duplicate analysis performed on samples MSA-B2122(3.25-3.75) and FB(20201204) for the redox and pH analysis and on sample MSA-B2223(3.0-3.5) for solids, percent, exhibited acceptable RPDs.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

## DATA REVIEW REPORT

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (ug/l)	Duplicate Result (ug/l)	RPD
SW-B40(7.5-8.0) / DUP03(20201215)	Redox Potential Vs H2	259	238	8 %
	Solids, Percent	90.9	90.6	AC
	pH	8.57	8.73	2 %

The RPDs between the parent and duplicate sample were acceptable.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential and pH were not reported in the analytical report.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SM4500S2-F-11, SM4500S2-F-11 and SM5310B-11	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:



---

DATE: January 12, 2020

PEER REVIEW: Rachelle Borne

DATE: January 13, 2020

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**







CHAIN OF CUSTODY

1

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08510
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

FED-EX Tracking #
Drill Order Control #
SGS Quote #
SGS Job # JD17885

Client / Reporting Information, Project Information, Requested Analysis, Matrix Codes, Turn Around Time, Deliverable, Comments / Special Instructions, Chain of Custody table, and signature blocks.

5.2
5

2.5 CIP



## DATA OF KNOWN QUALITY CONFORMANCE/NON-CONFORMANCE SUMMARY QUESTIONNAIRE

**Laboratory Name:** Accutest, Dayton, NJ

**Client:** Arcadis

**Project Location:** PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

**Project Number:** AGMPAL77493

**Sampling Dates:** 12/15/2020, 12/16/2020

**Laboratory Sample ID(s):** JD17885-5R, JD17885-15R, JD17885-5RT, JD17885-2, JD17885-3, JD17885-4, JD17885-5, JD17885-6, JD17885-7, JD17885-8, JD17885-9, JD17885-10, JD17885-11, JD17885-12, JD17885-13, JD17885-14, JD17885-15

**Methods Used:** SW846 3060A/7196A, SM4500S2- A-11, ASTM D3872-86, LLOYD KAHN 1988 MOD, ASTM D1498-76M, SM2540 G 18TH ED MOD, SW846 9045D, SW846 7196A, SM4500H+ B-11

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1A	Were the method specified handling, preservation, and holding time requirements met?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1B	EPH Method: Was the EPH method conducted without significant modifications (see Section 11.3 of respective DKQ methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Were samples received at an appropriate temperature (4+/- 2 Deg C)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
4	Were all QA/QC performance criteria specified in NJDEP DKQP standards achieved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	a) Were Reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt? b) Were these limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6	For each analytical method referenced in this laboratory report package, were result reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Notes:** For all questions to which the response was "No" (with the exception of question #7) see the Case Narrative in the technical report for additional information. If the answer to question #1, #1A or #1B is "No", the data package does not meet the requirements for "Data of Known Quality"

Generated by jadons on 01/06/2021 14:56



## Report of Analysis

<b>Client Sample ID:</b> SW-B40(7.5-8.0)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-2	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.65	0.44	0.35	mg/kg	1	12/21/20 13:31 RI	SW846	3060A/7196A
Redox Potential Vs H2	259			mv	1	12/18/20 17:31 ER	ASTM	D1498-76M
Solids, Percent	90.9			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.57 J			su	1	12/18/20 17:18 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(12.0-12.5)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-3	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8	0.49	0.39	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	256			mv	1	12/18/20 17:33 ER	ASTM	D1498-76M
Solids, Percent	83.4			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.88 J			su	1	12/18/20 17:21 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(14.0-14.5)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-4	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 79.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.52	0.41	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	125			mv	1	12/18/20 18:02 ER	ASTM	D1498-76M
Solids, Percent	79.4			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	11.00 J			su	1	12/18/20 17:24 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2122(12.0-12.5)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-5	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.3 J	0.43	0.34	mg/kg	1	12/23/20 12:44 RI	SW846	3060A/7196A
Redox Potential Vs H2	235			mv	1	12/22/20 15:39 ER	ASTM D1498-76M	
Solids, Percent	90.9			%	1	12/22/20 11:45 RI	SM2540 G 18TH ED MOD	
pH <sup>a</sup>	8.76 J			su	1	12/22/20 15:31 ER	SW846	9045D

(a) Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2122(12.0-12.5)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-5R	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.1 J	0.43	0.34	mg/kg	1	12/29/20 12:35 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> MSA-C2122(12.0-12.5)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-5RT	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.9
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	0.91 J	0.20	0.092	%	1	12/30/20 13:00 MP	ASTM	D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>12/30/20 13:00 MP</del>	<del>SM4500S2-A-11</del>	<del>R</del>
Total Organic Carbon <sup>c</sup>	24200	110	85	mg/kg	1	01/05/21 22:43 BM	LLOYD KAHN	1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.6  
4

## Report of Analysis

<b>Client Sample ID:</b> DUP03(20201215)	<b>Date Sampled:</b> 12/15/20
<b>Lab Sample ID:</b> JD17885-6	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 90.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.44	0.35	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	238			mv	1	12/18/20 18:17 ER	ASTM	D1498-76M
Solids, Percent	90.6			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.73 J			su	1	12/18/20 17:36 ER	SW846	9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(16.0-16.5)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-7	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 65.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.62	0.49	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	251			mv	1	12/18/20 18:19 ER	ASTM	D1498-76M
Solids, Percent	65.5			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.27 J			su	1	12/18/20 17:39 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B31(6.5-7.0)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-8	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 82.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.42 J	0.48	0.38	mg/kg	1	12/21/20 13:38 RI		SW846 3060A/7196A
Redox Potential Vs H2	238			mv	1	12/18/20 18:23 ER		ASTM D1498-76M
Solids, Percent	82			%	1	12/20/20 16:20 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.63 J			su	1	12/18/20 17:42 ER		SW846 9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.9  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B32(8.5-9.0)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-9	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	11.9	0.48	0.38	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	243			mv	1	12/18/20 18:24 ER	ASTM	D1498-76M
Solids, Percent	84.3			%	1	12/20/20 16:20 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	7.74 J			su	1	12/18/20 17:45 ER	SW846	9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B31(4.5-5.0)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-10	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.80	0.43	0.34	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	311			mv	1	12/18/20 16:57 ER	ASTM	D1498-76M
Solids, Percent	89.6			%	1	12/20/20 16:20 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	7.71 J			su	1	12/18/20 17:06 ER	SW846	9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B32(6.5-7.0)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-11	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.41 J	0.47	0.37	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	299			mv	1	12/18/20 16:59 ER	ASTM	D1498-76M
Solids, Percent	85.1			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.76 J			su	1	12/18/20 17:09 ER	SW846	9045D

(a) Temp of pH Reading: 24.2 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(11.0-11.5)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-12	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.13  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.3	0.46	0.36	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	241			mv	1	12/18/20 17:04 ER	ASTM	D1498-76M
Solids, Percent	88.5			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	9.67 J			su	1	12/18/20 17:12 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201216)		<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-13		<b>Date Received:</b> 12/16/20
<b>Matrix:</b> AQ - Field Blank Soil		<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ		

4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/16/20 19:23 EB	SW846	7196A
Redox Potential Vs H2	419			mv	1	12/18/20 16:09 ER	ASTM D1498-76	
pH <sup>a</sup>	6.65 J			su	1	12/18/20 15:53 ER	SM4500H+	B-11

(a) Field analysis required. Received out of hold time and analyzed by request. Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(15.5-16.0)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-14	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 54.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.15  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.74	0.59	mg/kg	1	12/21/20 13:38 RI	SW846	3060A/7196A
Redox Potential Vs H2	143			mv	1	12/18/20 17:17 ER	ASTM	D1498-76M
Solids, Percent	54.4			%	1	12/20/20 16:20 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.84 J			su	1	12/18/20 17:15 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B39(13.0-13.5)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-15	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.16  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.45	0.36	mg/kg	1	12/23/20 12:45 RI	SW846	3060A/7196A
Redox Potential Vs H2	239			mv	1	12/22/20 15:37 ER	ASTM	D1498-76M
Solids, Percent	85.5			%	1	12/22/20 11:45 RI	SM2540	G 18TH ED MOD
pH <sup>a</sup>	8.70 J			su	1	12/22/20 15:28 ER	SW846	9045D

(a) Temp of pH Reading: 25. Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B39(13.0-13.5)	<b>Date Sampled:</b> 12/16/20
<b>Lab Sample ID:</b> JD17885-15R	<b>Date Received:</b> 12/16/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.17  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.41 J	0.47	0.37	mg/kg	1	12/29/20 12:37 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Metals and Miscellaneous Analyses

SDG # JD17981

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey.

Report # 39879R  
Review Level: Tier II  
Project: 30065658.003

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## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD17981 for samples collected in association with the PPG Site 107 at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					MET	MISC
SW-B35(8.25-8.75)	JD17981-2	Soil	12/18/2020		X	X
SW-B35(8.25-8.75)	JD17981-2R	Soil	12/18/2020		X	X
SW-B35(8.25-8.75)	JD17981-2RT	Soil	12/18/2020		X	X
SW-B35(10.5-11.0)	JD17981-3	Soil	12/18/2020		X	X
SW-B35(10.5-11.0)	JD17981-3R	Soil	12/18/2020		X	X
SW-B35(10.5-11.0)	JD17981-3RT	Soil	12/18/2020		X	X
SW-B36(6.5-7.0)	JD17981-4	Soil	12/18/2020		X	X
SW-B36(6.5-7.0)	JD17981-4R	Soil	12/18/2020		X	X
DUP04(20201218)	JD17981-5	Soil	12/18/2020		X	X
DUP04(20201218)	JD17981-5R	Soil	12/18/2020	SW-B36(6.5-7.0)	X	X

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9056A, ASTM D1498-76, EPS 300/SW846 9056A, SM4500S2-F-11, SM5310 B-11 and SM4500H+ B-11. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJDEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

## DATA REVIEW REPORT

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

The MS analysis performed on sample IDs SW-B35(8.25-8.75) and SW-B35(10.5-11.0).

Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B35(8.25-8.75)	Hexavalent Chromium, Soluble	< 50%	< 50%
SW-B35(10.5-11.0)	Hexavalent Chromium, Soluble	< 50%	< 50%

## DATA REVIEW REPORT

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but $<$ 75%	Non-detect	UJ-
	Detect	J-
Spike recovery $<$ 50%	Non-detect	R
	Detect	R
Spike recovery $>$ 125%	Non-detect	No Action
Spike recovery $>$ 125% but $\leq$ 150%	Detect	J+
Spike recovery $>$ 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are  $<$  50% or  $>$  150% for both insoluble and soluble spikes, associated data will be rejected (“R”); otherwise qualify associated data if one of the spikes is outside the  $<$  50% or  $>$  150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis performed on sample IDs SW-B35(8.25-8.75) and SW-B35(10.5-11.0) exhibited RPDs within the control limit.

## 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD
SW-B36(6.5-7.0) / DUP04(20201218)	Chromium, Hexavalent	3.5	1.2	NC

Field duplicate RPD for compound chromium, hexavalent between parent and duplicate SW-B36(6.5-7.0) / DUP04(20201218) sample was greater than the laboratory control limit, the compound in the associated sample pair was qualified as estimated.



## DATA REVIEW REPORT

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X	X		
Dilution Factor		X		X	
Total vs Dissolved %D		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Soil	Not applicable	Cool to <6°C
Sulfide by SM4500S2-F-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by SM5310B-11	Soil	28 days from collection to analysis	Cool to <6°C
Iron, Ferrous by ASTM D3872-86	Soil	24 hours of receipt at laboratory	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Holding Time	Criteria
FB(20201218) SW-B35(8.25-8.75) SW-B35(10.5-11.0) SW-B36(6.5-7.0) DUP04(20201218)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
SW-B35(8.25-8.75)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
SW-B35(10.5-11.0)	7 days from collection to analysis	Analysis completed greater than two times holding time

Sample results associated with sample locations analyzed by analytical method pH by SM4500H+B, SM4500S2-F-11 and ASTM D3872-86 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method

## DATA REVIEW REPORT

blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

### 3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

MS/MSD analysis was not performed on any of the samples from this SDG.

#### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices.

The laboratory duplicate analysis performed on sample IDs SW-B35(8.25-8.75) and SW-B35(10.5-11.0) for redox and pH, exhibited acceptable RPDs.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (ug/l)	Duplicate Result (ug/l)	RPD
SW-B36(6.5-7.0) / DUP04(20201218)	Redox Potential Vs H2	246	269	AC
	Solids, Percent	91.2	91.5	AC
	pH	8.49	8.45	AC

## **DATA REVIEW REPORT**

The RPDs between the parent and duplicate were acceptable.

### **5. Laboratory Control Sample (LCS) Analysis**

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential and pH were not reported in the analytical report.

### **6. System Performance and Overall Assessment**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SM4500S2-F-11, SM4500S2-F-11 and SM5310B-11	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:



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DATE: January 13, 2020

PEER REVIEW: Rachelle Borne

DATE: January 13, 2020

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**







FB

# CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL 732-329-0200 FAX 732-329-3499  
www.sgs.com/ehsusa

FED-EX Tracking # PP  
K01-112420-152  
Bottle Order Control # K01-112420-152  
SGS Quote # JD 17981  
SGS Job # JD 17981

Company Name <b>Arccadis</b>		Project Name <b>PPG - Site 107</b>		Matrix Codes												
Street Address <b>10 Friends Ln</b>		Street <b>18 Chapel Ave</b>		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank												
City, State, Zip <b>Newton PA 18940</b>		City, State <b>Jersey City NJ</b>		Billing Information (if different from Report to)												
Project Contact <b>Jim McLaughlin</b>		Project # <b>30065658.20000</b>		Company Name												
Phone # <b>215-815-1030</b>		Client Purchase Order #		Street Address												
E-mail <b>Jmclaughlin@arccadis-us.com</b>		City, State, Zip		Attention:												
Sampler(s) Name(s) <b>J. Mateo</b>		Project Manager <b>J. McLaughlin</b>		Collection												
Phone # <b>(201) 893-4442</b>		Collection		Number of preserved bottles												
Lab Sample #	Field ID / Point of Collection	MECH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HN03	H2SO4	NONE	DI Water	MEDIA	ENCLOSURE	LAB USE ONLY
1	FB (20201218)	1F	12/18/20	0900	JM	S	2					X				
2	SW-B335(8.25-8.75)		12/18/20	1010	JM	S	1					X				G2
3	SW-B335(8.75-9.25)FB	2	12/18/20	1010	JM	S	1					X				D43
4	SW-B335(8.25-8.75)FB		12/18/20	1010	JM	S	1					X				
5	SW-B335(10.5-11.0)		12/18/20	1015	JM	S	1					X				
6	SW-B335(10.5-11.0)MS	3	12/18/20	1015	JM	S	1					X				
7	SW-B335(10.5-11.0)MS		12/18/20	1015	JM	S	1					X				
8	SW-B335(6.5-7.0)	4	12/18/20	1200	JM	S	1					X				
9	BWP 04 (20201218)	5	12/18/20	-	JM	S	1					X				

PP  
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JD 17981

5.2  
5

Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:		Data Deliverable Information				Comments / Special Instructions			
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input checked="" type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input checked="" type="checkbox"/> FULL T1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting		<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____				INITIAL ASSESSMENT <u>HA PP</u>  LABEL VERIFICATION _____			
Emergency & Rush TIA data available via LabLink		NJ Reduced = Results + QC Summary + Partner Raw data		Commercial "A" = Results Only; Commercial "B" = Results + QC Summary				Sample inventory is verified upon receipt in the Laboratory			
Sample Custody must be documented below each time samples change possession, including courier delivery.											
Relinquished by Sampler:	Date/Time:	Received By:	Date/Time:	Relinquished by:	Date/Time:	Received By:	Date/Time:	Relinquished by:	Date/Time:	Received By:	Date/Time:
1	12/18/20 14:00	Kory Cla	12/18/20 17:10	2	12/18/20 17:10	J. Mateo	12/18/20 17:10	3	12/18/20 17:10	J. Mateo	12/18/20 17:10
3				4				5			
5				Custody Seal # <u>14382</u>		<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact		Preserved where applicable <input type="checkbox"/>		Cooler Temp. <u>1RH X 2.9 C/H</u>	



## DATA OF KNOWN QUALITY CONFORMANCE/NON-CONFORMANCE SUMMARY QUESTIONNAIRE

**Laboratory Name:** Accutest, Dayton, NJ

**Client:** Arcadis

**Project Location:** PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

**Project Number:** AGMPAL77493

**Sampling Dates:** 12/18/2020

**Laboratory Sample ID(s):** JD17981-1, JD17981-2, JD17981-3, JD17981-4, JD17981-5, JD17981-2R, JD17981-3R, JD17981-4R, JD17981-5R, JD17981-2RT, JD17981-3RT

**Methods Used:** ASTM D1498-76, SW846 7196A, SM4500H+ B-11, ASTM D1498-76M, SM2540 G 18TH ED MOD, SW846 3060A/7196A, SW846 9045D, LLOYD KAHN 1988 MOD, SM4500S2- A-11, ASTM D3872-86

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1A	Were the method specified handling, preservation, and holding time requirements met?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1B	EPH Method: Was the EPH method conducted without significant modifications (see Section 11.3 of respective DKQ methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Were samples received at an appropriate temperature (4+/- 2 Deg C)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
4	Were all QA/QC performance criteria specified in NJDEP DKQP standards achieved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	a) Were Reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt? b) Were these limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6	For each analytical method referenced in this laboratory report package, were result reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Notes:** For all questions to which the response was "No" (with the exception of question #7) see the Case Narrative in the technical report for additional information. If the answer to question #1, #1A or #1B is "No", the data package does not meet the requirements for "Data of Known Quality"

Generated by jadons on 01/06/2021 14:53

## Report of Analysis

<b>Client Sample ID:</b> FB(20201218)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-1	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/18/20 23:09	EB	SW846 7196A
Redox Potential Vs H2	495			mv	1	12/21/20 17:43	ER	ASTM D1498-76
pH <sup>a</sup>	6.71 J			su	1	12/21/20 17:27	ER	SM4500H+ B-11

(a) Field analysis required. Received out of hold time and analyzed by request. Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(8.25-8.75)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-2	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.47	0.37	mg/kg	1	12/23/20 10:20 RI	SW846	3060A/7196A
Redox Potential Vs H2	311			mv	1	12/22/20 11:11 ER	ASTM	D1498-76M
Solids, Percent	84.1			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.65 J			su	1	12/21/20 17:30 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(8.25-8.75)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-2R	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.1
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND JJ	0.47	0.37	mg/kg	1	12/29/20 17:21 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

Client Sample ID: SW-B35(8.25-8.75)	Date Sampled: 12/18/20
Lab Sample ID: JD17981-2RT	Date Received: 12/18/20
Matrix: SO - Soil	Percent Solids: 84.1
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	1.3 J	0.20	0.092	%	1	12/30/20 13:00 MP	ASTM	D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>12/30/20 13:00 MP</del>	<del>SM4500S2-A-11</del>	<del>R</del>
Total Organic Carbon <sup>c</sup>	69600	120	92	mg/kg	1	01/05/21 13:53 BM	LLOYD KAHN	1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(10.5-11.0)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-3	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 78.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.50	0.40	mg/kg	1	12/23/20 10:28 RI		SW846 3060A/7196A
Redox Potential Vs H2	240			mv	1	12/22/20 11:18 ER		ASTM D1498-76M
Solids, Percent	78.4			%	1	12/22/20 15:37 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	7.23			su	1	12/21/20 17:33 ER		SW846 9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.5  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B35(10.5-11.0)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-3R	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 78.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND UJ	0.50	0.40	mg/kg	1	12/29/20 17:28 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B35(10.5-11.0)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-3RT	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 78.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	0.72 J	0.20	0.092	%	1	12/30/20 13:00 MP		ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>12/30/20 13:00 MP</del>		<del>SM4500S2-A-11</del> R
Total Organic Carbon <sup>c</sup>	4250	130	99	mg/kg	1	01/04/21 20:08 BM		LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(6.5-7.0) <b>Lab Sample ID:</b> JD17981-4 <b>Matrix:</b> SO - Soil <b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	<b>Date Sampled:</b> 12/18/20 <b>Date Received:</b> 12/18/20 <b>Percent Solids:</b> 91.2
--	--

4.8  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.7	0.43	0.34	mg/kg	1	12/23/20 10:28 RI		SW846 3060A/7196A
Redox Potential Vs H2	246			mv	1	12/22/20 11:23 ER		ASTM D1498-76M
Solids, Percent	91.2			%	1	12/22/20 15:37 BG		SM2540 G 18TH ED MOD
pH <sup>a</sup>	8.49 J			su	1	12/21/20 17:36 ER		SW846 9045D

(a) Temp of pH Reading: 24.9 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(6.5-7.0)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-4R	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	3.5 J	0.44	0.35	mg/kg	1	12/29/20 17:28 RI	SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> DUP04(20201218)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-5	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.0	0.44	0.35	mg/kg	1	12/23/20 10:28 RI	SW846	3060A/7196A
Redox Potential Vs H2	269			mv	1	12/22/20 11:31 ER	ASTM D1498-76M	
Solids, Percent	91.5			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.45 J			su	1	12/21/20 17:39 ER	SW846	9045D

(a) Temp of pH Reading: 24.7 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> DUP04(20201218)	<b>Date Sampled:</b> 12/18/20
<b>Lab Sample ID:</b> JD17981-5R	<b>Date Received:</b> 12/18/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 91.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2 J	0.43	0.34	mg/kg	1	12/29/20 17:28 RI	SW846	3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Metals and Miscellaneous Analyses

SDG # JD18055

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39880R  
Review Level: Tier II  
Project: 30065658.003

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## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD18055 for samples collected in association with the PPG Site 107 at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					MET	MISC
SW-B37(9.0-9.5)	JD18055-1	Soil	12/21/2020		X	X
SW-B37(9.0-9.5)	JD18055-1R	Soil	12/21/2020		X	X
SW-B37(9.0-9.5)	JD18055-1RT	Soil	12/21/2020		X	X
SW-B37(10.0-10.5)	JD18055-2	Soil	12/21/2020		X	X
SW-B37(10.0-10.5)	JD18055-2R	Soil	12/21/2020		X	X
SW-B37(12.0-12.5)	JD18055-3	Soil	12/21/2020		X	X
SW-B37(12.0-12.5)	JD18055-3R	Soil	12/21/2020		X	X
SW-B37(14.0-14.5)	JD18055-4	Soil	12/21/2020		X	X
SW-B37(14.0-14.5)	JD18055-4R	Soil	12/21/2020		X	X
SW-B37(15.0-15.5)	JD18055-5	Soil	12/21/2020		X	X
SW-B37(15.0-15.5)	JD18055-5R	Soil	12/21/2020		X	X
SW-B36(9.5-10.0)	JD18055-6	Soil	12/21/2020		X	X
SW-B36(9.5-10.0)	JD18055-6R	Soil	12/21/2020		X	X
SW-B36(9.5-10.0)	JD18055-6RT	Soil	12/21/2020		X	X
SW-B36(11.0-11.5)	JD18055-7	Soil	12/21/2020		X	X
SW-B36(11.0-11.5)	JD18055-7R	Soil	12/21/2020		X	X
SW-B40(16.0-16.5)	JD18055-8	Soil	12/21/2020		X	X
SW-B40(16.0-16.5)	JD18055-8R	Soil	12/21/2020		X	X
FB(20201221)	JD18055-9	Soil	12/21/2020		X	X
SW-B36(12.0-12.5)	JD18055-10	Soil	12/21/2020		X	X
SW-B36(12.0-12.5)	JD18055-10R	Soil	12/21/2020		X	X

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance



## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9056A, ASTM D1498-76, EPS 300/SW846 9056A, SM4500S2-F-11, , SM5310 B-11 and SM4500H+ B-11. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJDEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is

## DATA REVIEW REPORT

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

The MS analysis performed on sample SW-B37(9.0-9.5) and SW-B36(9.5-10.0).

Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B37(9.0-9.5)	Hexavalent Chromium, Soluble	< 50%	AC
SW-B36(9.5-10.0)	Hexavalent Chromium, Soluble	AC	<50%

## DATA REVIEW REPORT

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but $<$ 75%	Non-detect	UJ-
	Detect	J-
Spike recovery $<$ 50%	Non-detect	R
	Detect	R
Spike recovery $>$ 125%	Non-detect	No Action
Spike recovery $>$ 125% but $\leq$ 150%	Detect	J+
Spike recovery $>$ 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are  $<$  50% or  $>$  150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the  $<$  50% or  $>$  150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis performed on sample IDs SW-B37(9.0-9.5) and SW-B36(9.5-10.0) and exhibited RPDs within the control limit.

## 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate sample was not collected from this SDG.

## 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

## 8. System Performance and Overall Assessment

## **DATA REVIEW REPORT**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

# DATA REVIEW REPORT

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Soil	Not applicable	Cool to <6°C
Sulfide by SM4500S2-F-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by SM5310B-11	Soil	28 days from collection to analysis	Cool to <6°C
Iron, Ferrous by ASTM D3872-86	Soil	24 hours of receipt at laboratory	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Holding Time	Criteria
SW-B37(9.0-9.5) SW-B37(10.0-10.5) SW-B37(12.0-12.5) SW-B37(14.0-14.5) SW-B37(15.0-15.5) SW-B36(9.5-10.0) SW-B36(11.0-11.5) SW-B40(16.0-16.5) FB(20201221) SW-B36(12.0-12.5)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
SW-B37(9.0-9.5) SW-B36(9.5-10.0)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
SW-B37(9.0-9.5) SW-B36(9.5-10.0)	7 days from collection to analysis	Analysis completed greater than two times holding time

Sample results associated with sample locations analyzed by analytical method pH by SM4500H+B, SM4500S2-F-11 and ASTM D3872-86 were qualified, as specified in the table below. All other holding times were met.

## DATA REVIEW REPORT

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

### 3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS analysis performed on sample ID SW-B37(9.0-9.5) for ferrous iron exhibited an acceptable recovery.

#### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices.

The laboratory duplicate analysis performed on sample ID SW-B37(9.0-9.5) for iron, ferrous exhibited an acceptable RPD.

The laboratory duplicate analysis performed on sample IDs SW-B37(9.0-9.5), SW-B36(9.5-10.0), SW-B36(11.0-11.5) and FB(20201221) for redox potential, percent solid and pH exhibited acceptable RPDs.



## DATA REVIEW REPORT

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Field duplicate sample was not collected from any of the samples from this SDG.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential and pH were not reported in the analytical report.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SM4500S2-F-11, SM4500S2-F-11 and SM5310B-11	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:



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DATE: January 12, 2020

PEER REVIEW: Rachelle Borne

DATE: January 13, 2020

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**



SO  
FB

**CHAIN OF CUSTODY**

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL: 732-329-0200 FAX: 732-329-3499  
www.sgs.com/ehsus

<b>Reporting Information</b> Company Name: <b>Arcadis</b> Street Address: <b>10 Friends Ln</b> City: <b>Newtown PA</b> State: <b>PA</b> Zip: <b>18940</b> Project Contact: <b>Jim McLaughlin</b> Email: <b>smclaughlin@arcadis-us.com</b> Phone: <b>215-815-1030</b>		Project Name: <b>PPG - Site 107</b> Street: <b>18 Chapel Ave</b> City: <b>Jersey City</b> State: <b>NJ</b> Billing Information (if different from Report to) Company Name: _____ Street Address: _____ City: _____ State: _____ Zip: _____		Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
Project # _____ Client Purchase Order # _____		Attention: _____		Matrix Codes (continued) CR V. (INC EN ? PH ?) Nucleos/OPR	
Sampler(s) Name(s): <b>Cristin Ciculi</b> Phone # <b>201-264-8825</b> Project Manager: <b>J. McLaughlin</b>		Turnaround Time (Business days) _____		Data Deliverable Information <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> NYASP Category A <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category B <input checked="" type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> State Forms <input type="checkbox"/> NJ Reduced <input type="checkbox"/> EDD Format <input type="checkbox"/> Commercial "C" <input type="checkbox"/> Other _____ NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary	
Approved by (SGS Project Manager)/Date: _____		Comments / Special Instructions <b>* USE site-specific nucleos crushing and homogenization procedures</b>		Sample inventory is verified upon receipt in the Laboratory	
Relinquished by Sampler: <b>1</b> Date Time: <b>12/21/20 15:47</b> Relinquished by Sampler: <b>3</b> Date Time: _____ Relinquished by: <b>5</b> Date Time: _____		Received By: <b>2</b> Date Time: <b>12/21/20 17:06</b> Received By: <b>4</b> Date Time: _____ Received By: <b>4</b> Date Time: _____		Custody Seal # <b>14310</b> <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact Preserved where applicable <input type="checkbox"/> On Ice <input checked="" type="checkbox"/>	

Form:SM088-03C (revised 2/12/18)

ASSESSMENT MK 3 B  
LABEL VERIFICATION

http://www.sgs.com/en/terms-and-conditions

5.2  
5

SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL. 732-329-0200 FAX 732-329-3499  
 www.sgs.com/ehsus

FED-EX Tracking #	Boone Green Center #
SGS Quote #	SGS Job # <b>JD 18055</b>

Company Name <b>Arcadis</b>		Project Name <b>PPG-Site 107</b>		Matrix Codes											
Street Address <b>10 Friends Ln</b>		Street <b>18 Chapel Ave</b>		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB- Rinse Blank TB-Trip Blank											
City <b>Newtown PA 18940</b>		City <b>Trenton NJ</b>		LAB USE ONLY											
Project Contact <b>Jim McLaughlin</b>		Project # <b>38065658.2000</b>		Billing Information (if different from Report to)											
Phone # <b>215-815-1030</b>		Client Purchase Order #		Company Name											
Sample(s) Name(s) <b>Cristin Cicci</b>		Project Manager <b>J. McLaughlin</b>		Street Address											
Lab Sample #		MEQH/DI Vial #		City											
Field ID / Point of Collection		Date		State											
		Time		Zip											
		Sampled by		Attention:											
		Matrix		Number of preserved bottles											
		# of bottles		HCl											
				NaOH											
				HNO3											
				H2SO4											
				NONE											
				DI Water											
				MEQH											
				ENCORE											

Turnaround Time (Business days)	Approved by (SGS Project Manager) Date:	Data Deliverable Information	Comments / Special Instructions
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input checked="" type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____	_____ _____ _____ _____	<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input checked="" type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary	* Use site-specific nodule crushing and homogenization procedures Sample inventory is verified upon receipt in the Laboratory

Emergency & Rush T/A data available via LabLink				Sample Custody must be documented below each time samples change possession, including courier delivery.			
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:	Relinquished By:	Date Time:
1	12/21/2000 15:45	[Signature]	2	1706	2	[Signature]	
3			4		4		
5			5	14310			

5.2  
5

## DATA OF KNOWN QUALITY CONFORMANCE/NON-CONFORMANCE SUMMARY QUESTIONNAIRE

**Laboratory Name:** Accutest, Dayton, NJ

**Client:** Arcadis

**Project Location:** PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

**Project Number:** AGMPAL77493

**Sampling Dates:** 12/21/2020

**Laboratory Sample ID(s):** JD18055-1R, JD18055-2R, JD18055-3R, JD18055-4R, JD18055-5R, JD18055-6R, JD18055-7R, JD18055-8R, JD18055-10R, JD18055-1, JD18055-2, JD18055-3, JD18055-4, JD18055-5, JD18055-6, JD18055-7, JD18055-8, JD18055-9, JD18055-10, JD18055-1RT, JD18055-6RT

**Methods Used:** SW846 3060A/7196A, ASTM D1498-76M, SM2540 G 18TH ED MOD, SW846 9045D, SW846 7196A, SM4500H+ B-11, LLOYD KAHN 1988 MOD, SM4500S2- A-11, ASTM D3872-86

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1A	Were the method specified handling, preservation, and holding time requirements met?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1B	EPH Method: Was the EPH method conducted without significant modifications (see Section 11.3 of respective DKQ methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Were samples received at an appropriate temperature (4+/- 2 Deg C)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
4	Were all QA/QC performance criteria specified in NJDEP DKQP standards achieved?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	a) Were Reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt? b) Were these limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6	For each analytical method referenced in this laboratory report package, were result reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Notes:** For all questions to which the response was "No" (with the exception of question #7) see the Case Narrative in the technical report for additional information. If the answer to question #1, #1A or #1B is "No", the data package does not meet the requirements for "Data of Known Quality"

Generated by jadons on 01/06/2021 13:22

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(9.0-9.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-1	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.89 J	0.44	0.35	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	254			mv	1	12/23/20 13:18 ER	ASTM D1498-76M	
Solids, Percent	89.2			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.85 J			su	1	12/23/20 13:30 ER	SW846	9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4



## Report of Analysis

<b>Client Sample ID:</b> SW-B37(9.0-9.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-1R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By	Method
Chromium, Hexavalent	0.66 J	0.44	0.35	mg/kg	1	12/30/20 13:45 JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.2  
4

## Report of Analysis

Client Sample ID: SW-B37(9.0-9.5)	Date Sampled: 12/21/20
Lab Sample ID: JD18055-1RT	Date Received: 12/21/20
Matrix: SO - Soil	Percent Solids: 89.2
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	0.60 J	0.20	0.092	%	1	01/05/21 13:24 MP	ASTM	D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>01/05/21 13:24 MP</del>	<del>SM4500S2-A-11</del>	<del>R</del>
Total Organic Carbon <sup>c</sup>	7770	110	87	mg/kg	1	01/05/21 14:51 BM	LLOYD KAHN	1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(10.0-10.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-2	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.9	0.48	0.38	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	269			mv	1	12/23/20 13:48 ER	ASTM	D1498-76M
Solids, Percent	81.6			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.87 J			su	1	12/23/20 13:36 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(10.0-10.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-2R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 81.6
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.9	0.48	0.38	mg/kg	1	12/30/20 13:45	JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(12.0-12.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-3	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.2	0.49	0.38	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	290			mv	1	12/23/20 13:50 ER	ASTM	D1498-76M
Solids, Percent	80.8			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.01 J			su	1	12/23/20 13:39 ER	SW846	9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(12.0-12.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-3R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.8
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.7	0.49	0.38	mg/kg	1	12/30/20 13:45	JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(14.0-14.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-4	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3	0.46	0.37	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	301			mv	1	12/23/20 13:54 ER	ASTM	D1498-76M
Solids, Percent	83.3			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.91 J			su	1	12/23/20 13:42 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(14.0-14.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-4R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.7	0.48	0.38	mg/kg	1	12/30/20 13:45	JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B37(15.0-15.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-5	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 79.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.8	0.49	0.39	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	283			mv	1	12/23/20 14:02 ER	ASTM	D1498-76M
Solids, Percent	79.4			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.68			su	1	12/23/20 13:45 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B37(15.0-15.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-5R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 79.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.1	0.50	0.39	mg/kg	1	12/30/20 13:45	JOO	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(9.5-10.0)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-6	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.80 <span style="color: red;">J</span>	0.45	0.36	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	269			mv	1	12/23/20 14:05 ER	ASTM D1498-76M	
Solids, Percent	87.4			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.76 <span style="color: orange;">J</span>			su	1	12/23/20 13:57 ER	SW846	9045D

(a) Temp of pH Reading: 24.3 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(9.5-10.0)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-6R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 87.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.3 J	0.45	0.35	mg/kg	1	12/30/20 13:45	JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

Client Sample ID: SW-B36(9.5-10.0)	Date Sampled: 12/21/20
Lab Sample ID: JD18055-6RT	Date Received: 12/21/20
Matrix: SO - Soil	Percent Solids: 87.4
Project: PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.14  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Iron, Ferrous <sup>a</sup>	0.74 J	0.20	0.092	%	1	01/05/21 13:24 MP	ASTM	D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>01/05/21 13:24 MP</del>	<del>SM4500S2-A-11</del>	<del>R</del>
Total Organic Carbon <sup>c</sup>	6510	110	89	mg/kg	1	01/06/21 00:29 BM	LLOYD KAHN	1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(11.0-11.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-7	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 83.7
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.15  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.8	0.47	0.37	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	217			mv	1	12/23/20 15:36 ER	ASTM	D1498-76M
Solids, Percent	83.7			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.88 J			su	1	12/23/20 15:41 ER	SW846	9045D

(a) Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(11.0-11.5) <b>Lab Sample ID:</b> JD18055-7R <b>Matrix:</b> SO - Soil <b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	<b>Date Sampled:</b> 12/21/20 <b>Date Received:</b> 12/21/20 <b>Percent Solids:</b> 83.7
---	--

4.16  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By Method
Chromium, Hexavalent	2.0	0.46	0.37	mg/kg	1	12/30/20 13:45 JOO SW846	3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B40(16.0-16.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-8	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 76.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.17  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.51	0.40	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	100			mv	1	12/23/20 14:19 ER	ASTM	D1498-76M
Solids, Percent	76.5			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	10.56 J			su	1	12/23/20 14:00 ER	SW846	9045D

(a) Temp of pH Reading: 24.4 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B40(16.0-16.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-8R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 76.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.18  
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### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By	Method
Chromium, Hexavalent	ND	0.51	0.41	mg/kg	1	12/30/20 13:45 JOO	SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201221)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-9	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND	0.010	0.0058	mg/l	1	12/21/20 21:15 EB	SW846	7196A
Redox Potential Vs H2	427			mv	1	12/23/20 15:09 ER	ASTM D1498-76	
pH <sup>a</sup>	7.09 J			su	1	12/23/20 15:07 ER	SM4500H+	B-11

(a) Field analysis required. Received out of hold time and analyzed by request. Temp of pH Reading: 25.2 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(12.0-12.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-10	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.20  
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### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.0	0.47	0.37	mg/kg	1	12/24/20 11:50 JOO	SW846	3060A/7196A
Redox Potential Vs H2	225			mv	1	12/23/20 13:24 ER	ASTM	D1498-76M
Solids, Percent	84			%	1	12/22/20 15:37 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.68 J			su	1	12/23/20 13:33 ER	SW846	9045D

(a) Temp of pH Reading: 24.5 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B36(12.0-12.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18055-10R	<b>Date Received:</b> 12/21/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 84.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.21  
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### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By Method
Chromium, Hexavalent	ND	0.47	0.38	mg/kg	1	12/30/20 13:45 JOO SW846 3060A/7196A	

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

PPG Site 107

# DATA QUALITY ASSESSMENT

18 Chapel Avenue  
Jersey City, New Jersey

Metals and Miscellaneous Analyses

SDG # JD18116

Analyses Performed By:  
SGS Accutest  
Dayton, New Jersey

Report #39881R  
Review Level: Tier II  
Project: 30065658.003

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## DATA REVIEW REPORT

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # JD18116 for samples collected in association with the PPG Site 107 at 18 Chapel Avenue, NJ. The review was conducted as a Tier II evaluation and included review of data package completeness. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					MET	MISC
SW-B38(14.0-14.5)	JD18116-1	Soil	12/21/2020		X	X
SW-B38(14.0-14.5)	JD18116-1R	Soil	12/21/2020		X	X
SW-B38(13.0-13.5)	JD18116-2	Soil	12/21/2020		X	X
SW-B38(13.0-13.5)	JD18116-2R	Soil	12/21/2020		X	X
SW-B38(11.0-11.5)	JD18116-3	Soil	12/21/2020		X	X
SW-B38(11.0-11.5)	JD18116-3R	Soil	12/21/2020		X	X
DUP05(20201221)	JD18116-4	Soil	12/21/2020	SW-B38 (13.0-13.5)	X	X
DUP05(20201221)	JD18116-4R	Soil	12/21/2020	SW-B38 (13.0-13.5)	X	X
FB(20201221)	JD18116-5	Soil	12/22/2020		X	X
SW-B38(15.0-15.5)	JD18116-6	Soil	12/22/2020		X	X
SW-B38(15.0-15.5)	JD18116-6R	Soil	12/22/2020		X	X
SW-B38(15.0-15.5)	JD18116-6RT	Soil	12/22/2020		X	X

## DATA REVIEW REPORT

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:

QA - Quality Assurance

## DATA REVIEW REPORT

### INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 7196A, 9056A, ASTM D1498-76, EPS 300/SW846 9056A, SM4500S2-F-11, , SM5310 B-11 and SM4500H+ B-11. Data were reviewed in accordance with USEPA Region 2 SOP HW-2b, Revision 15 (December 2012), and NJDEP Data Quality Assessment and Data Usability Evaluation Technical Guidance, New Jersey Department of Environmental Protection, Site Remediation Program (April 2014).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with the USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but not detected. The associated value is the analyte instrument detection limit.
  - B The reported value was obtained from a reading less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL).
- Quantitation (Q) Qualifiers
  - E The reported value is estimated due to the presence of interference.
  - N Spiked sample recovery is not within control limits.
  - \* Duplicate analysis is not within control limits.
- Validation Qualifiers
  - J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected above the reporting limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is



## DATA REVIEW REPORT

that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW REPORT

### HEXAVALENT CHROMIUM ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 7196A	Water	24 hours from collection to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

#### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Analytes were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

#### 3. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

##### 3.1 MS Analysis

Soluble and insoluble spike sample analyses are designed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The insoluble spike is used to evaluate the dissolution during the digestion process. Hexavalent chromium must exhibit a percent recovery within the established acceptance limits of 75% to 125% in both the soluble and insoluble spiked analyses. The control limits do not apply when the parent sample concentration exceeds the spike amount by a factor of four or greater.

The MS analysis performed on sample SW-B38(14.0-14.5).

Samples associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Analyte	Initial Spike Recovery	Reanalysis Spike Recovery
SW-B38(14.0-14.5)	Hexavalent Chromium, Soluble	< 50%	< 50%

The criteria used to evaluate spike recoveries are presented in the following table. The qualifications are applied to the parent sample results only. In the event of a recovery outside of the control limits, the MS must be reanalyzed.

## DATA REVIEW REPORT

Control limit	Sample Result	Qualification <sup>1</sup>
Spike recovery $\geq$ 50% but < 75%	Non-detect	UJ-
	Detect	J-
Spike recovery < 50%	Non-detect	R
	Detect	R
Spike recovery > 125%	Non-detect	No Action
Spike recovery > 125% but $\leq$ 150%	Detect	J+
Spike recovery > 150%	Detect	R

### Notes:

<sup>1</sup> If recoveries are < 50% or > 150% for both insoluble and soluble spikes, associated data will be rejected ("R"); otherwise qualify associated data if one of the spikes is outside the < 50% or > 150% limits.

The original analyses of the field samples are usable with appropriate qualification. No sample results were rejected.

### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to four times the RL. A control limit of 20% is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to four times the RL, a control limit of  $\pm$  the RL is used.

The laboratory duplicate analysis performed on sample ID SW-B38(14.0-14.5) exhibited an RPD within the control limit.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD
SW-B38 (13.0-13.5) /DUP05(20201221)	Chromium, Hexavalent	U	0.69	AC

The RPD between the parent and duplicate sample was acceptable.

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

### 8. System Performance and Overall Assessment

## **DATA REVIEW REPORT**

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

# DATA REVIEW REPORT

## DATA VALIDATION CHECKLIST FOR HEXAVALENT CHROMIUM

HEXAVALENT CHROMIUM: SW-846 7196A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Spectrophotometer					
<b>Tier II Validation</b>					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method Blanks		X		X	
C. Equipment/Field Blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	
Total vs Dissolved %D		X		X	

**Notes:**

%R Percent recovery

RPD Relative percent difference

%RSD Relative percent deviation

## DATA REVIEW REPORT

### GENERAL CHEMISTRY ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
pH by SM4500H+B	Soil	QAPP: 24 hours of receipt at laboratory	Cool to <6°C
Oxidation-Reduction Potential by ASTM D1498-76	Soil	Not applicable	Cool to <6°C
Sulfide by SM4500S2-F-11	Soil	7 days from collection to analysis	Cool to <6°C
Total Organic Carbon (TOC) by SM5310B-11	Soil	28 days from collection to analysis	Cool to <6°C
Iron, Ferrous by ASTM D3872-86	Soil	24 hours of receipt at laboratory	Cool to <6°C

The analyses that exceeded the holding time are presented in the following table.

Sample ID	Holding Time	Criteria
SW-B38(14.0-14.5) SW-B38(13.0-13.5) SW-B38(11.0-11.5) DUP05(20201221) FB(20201221) SW-B38(15.0-15.5)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
SW-B38(15.0-15.5)	24 hours of receipt at laboratory	Analysis completed greater than two times holding time
SW-B38(15.0-15.5)	7 days from collection to analysis	Analysis completed greater than two times holding time

Sample results associated with sample locations analyzed by analytical method pH by SM4500H+B, SM4500S2-F-11 and ASTM D3872-86 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

## DATA REVIEW REPORT

### 2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Method blank analysis is not applicable for Redox and pH analyses.

### 3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)/Laboratory Duplicate Analysis

MS/MSD and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

#### 3.1 MS/MSD Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

MS/MSD analysis was not performed on any of the samples from this SDG.

#### 3.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the RL. A control limit of 20% for water matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of one times the RL is applied for water matrices.

The laboratory duplicate analysis performed on sample ID SW-B38(14.0-14.5) for redox potential and pH exhibited acceptable RPDs.

### 4. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of three times the RL is applied for soil matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Analyte	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD
SW-B38 (13.0-13.5) /DUP05(20201221)	Redox Potential Vs H2	371	371	0 %
	Solids, Percent	88.3	88.4	0 %
	pH a	7.58	7.72	2 %

The RPDs between the parent and duplicate samples were acceptable.

## DATA REVIEW REPORT

### 5. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

LCS results for redox potential and pH were not reported in the analytical report.

### 6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.



## DATA REVIEW REPORT

### DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SM4500H+B, SM4500S2-F-11, SM4500S2-F-11 and SM5310B-11	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
<b>Tier II Validation</b>					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks	X				X
B. Method blanks		X		X	
C. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field/Lab Duplicate (RPD)		X		X	
Dilution Factor		X		X	

Notes:

%R Percent recovery

RPD Relative percent difference

## DATA REVIEW REPORT

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:



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DATE: January 13, 2020

PEER REVIEW: Rachelle Borne

DATE: January 13, 2020

**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





## DATA OF KNOWN QUALITY CONFORMANCE/NON-CONFORMANCE SUMMARY QUESTIONNAIRE

**Laboratory Name:** Accutest, Dayton, NJ

**Client:** Arcadis

**Project Location:** PPG Site 107, 18 Chapel Avenue, Jersey City, NJ

**Project Number:** AGMPAL77493

**Sampling Dates:** 12/21/2020

**Laboratory Sample ID(s):** JD18116-1, JD18116-2, JD18116-3, JD18116-4, JD18116-5, JD18116-6, JD18116-1R, JD18116-2R, JD18116-3R, JD18116-4R, JD18116-6R, JD18116-6RT

**Methods Used:** ASTM D1498-76M, SM2540 G 18TH ED MOD, SW846 3060A/7196A, SW846 9045D, SW846 7196A, SM4500H+ B-11, LLOYD KAHN 1988 MOD, SM4500S2- A-11, ASTM D3872-86

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the NJDEP Data of Known Quality performance standards?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1A	Were the method specified handling, preservation, and holding time requirements met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1B	EPH Method: Was the EPH method conducted without significant modifications (see Section 11.3 of respective DKQ methods)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	Were samples received at an appropriate temperature (4+/- 2 Deg C)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
4	Were all QA/QC performance criteria specified in NJDEP DKQP standards achieved? See section 5.6	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5	a) Were Reporting limits specified or referenced on the chain-of-custody or communicated to the laboratory prior to sample receipt?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	b) Were these limits met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6	For each analytical method referenced in this laboratory report package, were result reported for all constituents identified in the method-specific analyte lists presented in the DKQP documents and/or site-specific QAPP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7	Are project-specific matrix spikes and/or laboratory duplicates included in this data set?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**Notes:** For all questions to which the response was "No" (with the exception of question #7) see the Case Narrative in the technical report for additional information. If the answer to question #1, #1A or #1B is "No", the data package does not meet the requirements for "Data of Known Quality"

Generated by vickyp on 01/06/2021 12:49

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(14.0-14.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-1	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.6	0.52	0.41	mg/kg	1	12/29/20 15:48 RI	SW846	3060A/7196A
Redox Potential Vs H2	374			mv	1	12/29/20 13:24 ER	ASTM	D1498-76M
Solids, Percent	80.2			%	1	12/23/20 16:27 BG	SM2540	G 18TH ED MOD
pH <sup>a</sup>	7.29 J			su	1	12/29/20 13:21 ER	SW846	9045D

(a) Temp of pH Reading: 25.3 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(14.0-14.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-1R	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 80.2
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	ND	0.48	0.38	mg/kg	1	01/02/21 15:20 JOO SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(13.0-13.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-2	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.59	0.47	0.37	mg/kg	1	12/29/20 15:48 RI	SW846	3060A/7196A
Redox Potential Vs H2	371			mv	1	12/29/20 13:26 ER	ASTM	D1498-76M
Solids, Percent	88.3			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.58 J			su	1	12/29/20 13:24 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.3  
4



## Report of Analysis

<b>Client Sample ID:</b> SW-B38(13.0-13.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-2R	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.3
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By	Method
Chromium, Hexavalent	ND	0.44	0.35	mg/kg	1	01/02/21 15:20 JOO	SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(11.0-11.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-3	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.96	0.45	0.36	mg/kg	1	12/29/20 15:48 RI	SW846	3060A/7196A
Redox Potential Vs H2	367			mv	1	12/29/20 13:28 ER	ASTM	D1498-76M
Solids, Percent	89.5			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.02 J			su	1	12/29/20 13:27 ER	SW846	9045D

(a) Temp of pH Reading: 24.6 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(11.0-11.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-3R	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 89.5
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.6  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	0.69	0.44	0.35	mg/kg	1	01/02/21 15:20 JOO SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> DUP05(20201221)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-4	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.58	0.46	0.36	mg/kg	1	12/29/20 15:48 RI	SW846	3060A/7196A
Redox Potential Vs H2	371			mv	1	12/29/20 13:31 ER	ASTM	D1498-76M
Solids, Percent	88.4			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	7.72 J			su	1	12/29/20 13:30 ER	SW846	9045D

(a) Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> DUP05(20201221)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-4R	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 88.4
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	0.65	0.45	0.36	mg/kg	1	01/02/21 15:20 JOO SW846 3060A/7196A

RL = Reporting Limit  
 MDL = Method Detection Limit

ND = Not detected  
 J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> FB(20201221)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-5	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> AQ - Field Blank Soil	<b>Percent Solids:</b> n/a
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent <sup>a</sup>	ND	0.010	0.0058	mg/l	1	12/22/20 22:59	EB	SW846 7196A
Redox Potential Vs H2	339			mv	1	12/23/20 15:21	ER	ASTM D1498-76
pH <sup>b</sup>	6.72 J			su	1	12/23/20 15:10	ER	SM4500H+ B-11

(a) Analysis done out of holding time.

(b) Field analysis required. Received out of hold time and analyzed by request. Temp of pH Reading: 25.1 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(15.0-15.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-6	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.10  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	ND <span style="color: red;">UJ</span>	0.46	0.36	mg/kg	1	12/29/20 15:45 RI	SW846	3060A/7196A
Redox Potential Vs H2	276			mv	1	12/23/20 14:25 ER	ASTM	D1498-76M
Solids, Percent	85			%	1	12/23/20 16:27 BG	SM2540 G	18TH ED MOD
pH <sup>a</sup>	8.44 <span style="color: orange;">J</span>			su	1	12/23/20 14:03 ER	SW846	9045D

(a) Temp of pH Reading: 24.8 Deg. C

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL

## Report of Analysis

<b>Client Sample ID:</b> SW-B38(15.0-15.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-6R	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.11  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By Method
Chromium, Hexavalent	ND UJ	0.46	0.36	mg/kg	1	01/02/21 15:20 JOO SW846 3060A/7196A

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL



## Report of Analysis

<b>Client Sample ID:</b> SW-B38(15.0-15.5)	<b>Date Sampled:</b> 12/21/20
<b>Lab Sample ID:</b> JD18116-6RT	<b>Date Received:</b> 12/22/20
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 85.0
<b>Project:</b> PPG Site 107, 18 Chapel Avenue, Jersey City, NJ	

4.12  
4

### General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed By	Method
Iron, Ferrous <sup>a</sup>	0.84 J	0.20	0.092	%	1	01/05/21 13:24 MP	ASTM D3872-86
<del>Sulfide Screen <sup>b</sup></del>	<del>NEGATIVE</del>				<del>1</del>	<del>01/05/21 13:24 MP</del>	<del>SM4500S2-A-11</del> R
Total Organic Carbon <sup>c</sup>	37500	120	91	mg/kg	1	01/05/21 16:29 BM	LLOYD KAHN 1988 MOD

- (a) The ferrous iron test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (b) The sulfide screen test was analyzed after completion of Cr6 testing (outside of normal hold times for this parameter) in order to provide more information about the possible impact of the sample matrix on Cr6 recoveries.
- (c) Analysis done out of holding time.

RL = Reporting Limit  
MDL = Method Detection Limit

ND = Not detected  
J = Indicates a result > = MDL but < RL