Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile Analyses

SDG#E3697, E4915, F1600

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #21712R
Review Level: Tier III
Project: NJ000514.0007.00002

319463

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) #E3697, E4915, and F1600 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB	PEST	MET
E3697	AIR001(913)	E3697-01	Air	9/13/2013		X				
	AIR002(913)	E3697-02	Air	9/13/2013		X				
	AIR003(913)	E3697-03	Air	9/13/2013		X				
E4915	AIRMID-002	E4915-01	Air	12/23/2013		X				
	AIREFF-002	E4915-02	Air	12/23/2013		X				
	AIRIN-002	E4915-03	Air	12/23/2013		X				
F1600	INF004	F1600-01	Air	3/10/14		X				
	MID004	F1600-02	Air	3/10/14		X				
	EFF004	F1600-03	Air	3/10/14		X				

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999 and USEPA Region II SOP HW-31- Validating Air Samples Volatile Organic Analysis of Ambient Air In Canister by Method TO-15 of October 2006.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
EPA TO-15	Air	30 days from collection to analysis	Ambient Temperature

s.u. Standard units

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 (common laboratory contaminant compounds are calculated at ten times) 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.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (B) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
AIR001(913) INF004 MID004 EFF004	Methylene chloride	Detected sample results >RL and <BAL	“UB” at detected sample concentration

RL Reporting limit

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 24-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (30%) and an RRF value greater than the control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (30%) and RRF value greater than the control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
AIR001(913) AIR002(913) AIR003(913)	ICV %RSD	Methylene chloride	34.4%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 30%	Non-detect	UJ
		Detect	J
Continuing Calibration	%D >30% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >30% (decrease in sensitivity)	Non-detect	UJ
		Detect	J

1 RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketenes, 1,4-dioxane, etc.)

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 40% or less than 40% of the area counts of the associated continuing calibration standard.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
AIR001(913)	Bromochloromethane	AC
	1,4-Difluorobenzene	AC
	Chlorobenzene-d5	27.4%
AIR002(913)	Bromochloromethane	AC
	1,4-Difluorobenzene	AC
	Chlorobenzene-d5	31.9%

AC Acceptable

The criteria used to evaluate the internal standard responses are presented in the following table. In the case of an internal standard deviation, the compounds quantitated under the deviant internal standard are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No action
	Detect	J
< 40% but > 25%	Non-detect	UJ
	Detect	J
< 25%	Non-detect	R
	Detect	J

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the established acceptance limits of 70% to 130%. The relative percent difference (RPD) between the LCS/LCSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
AIR001(913) AIR002(913) AIR003(913)	Dichlorodifluoromethane	>UL	-
AIRMID-002 AIREFF-002 AIRIN-002	1,4-Dioxane	>UL	-

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

Control Limit	Sample Result	Qualification
LCS percent recovery >130%	Non-detect	No Action
	Detect	J
LCS percent recovery <70% but > 10%	Non-detect	J
	Detect	J
< 10%	Non-detect	R
	Detect	J

8. 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 air 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 three times the RL is applied for air matrices.

All compounds associated with laboratory duplicate RPD were within the control limits.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 100% for air 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 air matrices.

Field duplicates were not performed as part of this SDG.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
AIR001(913)	tert-Butyl alcohol	15.8 E	12.1 D	12.1 D
	Acetone	92 E	69.2 D	69.2 D
	2-Butanone	33.7 E	18.8 D	18.8 D
AIR002(913)	tert-Butyl alcohol	18.1 E	13.6 D	13.6 D
	Acetone	120 E	79.4 D	79.4 D
	2-Butanone	38.4 E	22.3 D	22.3 D
AIR003(913)	Acetone	120 E	99.7 D	99.7 D
	Methylene chloride	31.9 E	28.1 D	28.1 D
	2-Butanone	21.9 E	15.9 D	15.9 D
	Hexane	37.2 E	27.2 D	27.2 D
AIRIN-002	Cyclohexane	19.7 E	17.4 D	17.4 D
	2,2,4-Trimethylpentane	24.2 E	28.1 D	28.1 D
MID004	Acetone	18.5 E	20.8 D	20.8 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-1"Hg)		X		X	
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks		X		X	
A. Method blanks		X	X		
B. Equipment blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)					X
LCS/LCSD Precision (RPD)					X
Field/Lab Duplicate (%D)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X	X		
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X	X		
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present	X			X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Percent relative difference
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: May 19, 2014

PEER REVIEW: Dennis Capria

DATE: June 3, 2014

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : E3697

Client Contact Information	Bottle Order ID : **B1309019**	Courier :	1 of 3 COCs
Client ID : **CREA02** Project ID :	**ARC Horseshoe Road**	Sampler Name(s) :	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
	Phone Number : **201-968-3304**		
Address : **215 Union Street**	Fax Number : **2019683301**		
	Site Details:	Batch Certified	
City : **Hackensack**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07601**	Standard : **15 business days** **OR**	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
~~Air003(913)~~ Air001(913)	9/13	845	1545	-30	-10	62	71	-30	-11.6	10640	10314	6 L	12.5	VL020693.D	X							

Temperature (Fahrenheit)

	Ambient	Maximum	Minimum	
Start	64°F	73°F		
Stop	71°F			

GC/MS Analyst Signature (TO-15) [signature]

Pressure (Inches of Hg)

	Ambient	Maximum	Minimum	
Start	29.72			
Stop	28.32			

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: O High O Medium O Low O PID Readings: O

Sampling site (State): ~~INFLUENT~~ wmh Effluent

Quick Connector required : NO

Canisters Shiped by: [signature]	Date/Time: 9/10/13	Canisters Received by:	Date/Time:
Samples Relinquished by: [signature]	Date/Time: 9/13/13	Received by: [signature]	Date/Time: 9.13.13 1600
Relinquished by: [signature]	Date/Time: 9-13-13 1655	Received by: PS	Date/Time: 9/13/13 1655

B1309019 - 2

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : E3697

Client Contact Information	Bottle Order ID : **B1309019**	Courier :	2 of 3 COCs
Client ID : **CREA02** Project ID : **ARC Horseshoe Road**		Sampler Name(s) : V.A	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
	Phone Number : **201-968-3304**		
Address : **215 Union Street**	Fax Number : **2019683301**		
	Site Details:	Batch Certified	
City : **Hackensack**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07601**	Standard : **15 business days** **OR**	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
WMR ~~Air001(913)~~ Air002(913)	9/13	845	1546	-30	-15	62	71	-30	-15.7	10103	10608	6 L	12.5	VL020693.D								

Temperature (Fahrenheit)

	Ambient	Maximum	Minimum	
Start	64°F	73°F		
Stop	71° F			

GC/MS Analyst Signature (TO-15) [signature]

Pressure (Inches of Hg)

	Ambient	Maximum	Minimum	
Start	29.72			
Stop	28.32			

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: O High O Medium O Low O PID Readings: O

Sampling site (State): ~~Stack (effluent)~~ WMR Mid-fluent

Quick Connector required : NO

Canisters Shiped by: [signature]	Date/Time: 9/10/13	Canisters Received by:	Date/Time:
Samples Relinquished by: [signature]	Date/Time: 9/13/13	Received by: [signature]	Date/Time: 9.13.13 1600
Relinquished by: [signature]	Date/Time: 9.13.13 1655	Received by: PS	Date/Time: 9/13/13 1655

B1309019 - 3

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : E3697

Client Contact Information	Bottle Order ID : **B1309019**	Courier :	3 of 3 COCs
Client ID : **CREA02** Project ID :	**ARC Horseshoe Road**	Sampler Name(s) : VA	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
	Phone Number : **201-968-3304**		
Address : **215 Union Street**	Fax Number : **2019683301**	Batch Certified	
	Site Details:		
City : **Hackensack**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07601**	Standard : **15 business days** OR	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15			Indoor/Ambinet Air	Soil Gas		
~~Air002(9/13)~~ VA Air003(9/13)	9/13	845	1547	-30	-10	62	71	-30	-8.4	10546	10197	6 L	12.5	VL020693.D	X						

Temperature (Fahrenheit)	Ambient	Maximum	Minimum	
Start	62°F			
Stop	71°			

Pressure (Inches of Hg)	Ambient	Maximum	Minimum	
Start	29.72			
Stop	28.32			

GC/MS Analyst Signature (TO-15)

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: ○ High ○ Medium ○ Low ○ PID Readings: ○

Sampling site (State): ~~MDFLUENT~~ ~~EFFLUENT~~ VA INFLUENT

Quick Connector required : NO

Canisters Shiped by:	Date/Time: 9/10/13	Canisters Received by:	Date/Time:
Samples Relinquished by: VA	Date/Time: 9/13/13	Received by:	Date/Time: 9.13.13 1600
Relinquished by:	Date/Time: 9.13.13 1655	Received by: PS	Date/Time: 9/13/13 1655

B1309019 - 1

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road Air	Date Received:	09/13/13
Client Sample ID:	AIR001(913)	SDG No.:	E3697
Lab Sample ID:	E3697-01	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020971.D	1		09/17/13	VL091713

CAS Number	Parameter		Conc. ppbv	Conc. ug/M3		Qualifier		MDL	LOD	LOQ / CRQL	Units
TARGETS											
75-71-8	Dichlorodifluoromethane		0.97	4.8		~~Q~~	J	0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane		1.3	2.68				0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride		11.5	29.4				0.08	0.08	1.28	ug/m3
74-83-9	Bromomethane		0.1	0.39		U		0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane		1	2.64				0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran		6.3	18.6				0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane		0.17	0.96		J		0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane		0.1	0.77		U		0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane		0.13	0.91		J		0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene		0.1	0.44		U		0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	12.1	~~15.8~~	~~47.9~~	36.7	~~E~~	D	0.3	0.3	1.52	ug/m3
142-82-5	Heptane		2	8.2				0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene		0.1	0.4		U		0.2	0.4	1.98	ug/m3
67-64-1	Acetone	69.2	~~92~~	~~218~~	164	~~E~~	D	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide		5.9	18.4				0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether		0.1	0.36		U		0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride		2.4	8.34	UBJ	~~B~~		0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene		0.1	0.4		U		0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane		0.1	0.4		U		0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane		0.1	0.34		U		0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	18.8	~~33.7~~	~~99.4~~	55.4	~~E~~	D	0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride		0.11	0.69		J		0.19	0.19	3.15	ug/m3
156-59-2	cis-1,2-Dichloroethene		0.1	0.4		J		0.2	0.4	1.98	ug/m3
67-66-3	Chloroform		0.1	0.49		U		0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane		0.03	0.16		U		0.16	0.16	2.73	ug/m3
540-84-1	2,2,4-Trimethylpentane		0.1	0.47		U		0.19	0.47	2.34	ug/m3
71-43-2	Benzene		1.8	5.75				0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane		0.91	3.68				0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene		0.24	1.29		J		0.11	0.16	2.69	ug/m3
78-87-5	1,2-Dichloropropane		0.1	0.46		U		0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane		0.1	0.67		U		0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone		0.26	1.07		J		0.2	0.41	2.05	ug/m3
108-88-3	Toluene		5.4	20.4				0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene		0.1	0.45		U		0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene		0.1	0.45		U		0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane		0.1	0.55		U		0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane		0.1	0.85		U		0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane		0.1	0.77		U		0.77	0.77	3.84	ug/m3

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road Air	Date Received:	09/13/13
Client Sample ID:	AIR001(913)	SDG No.:	E3697
Lab Sample ID:	E3697-01	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020971.D	1		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.47	3.19	J	0.2	0.2	3.39	ug/m3
108-90-7	Chlorobenzene	0.1	0.46	U J	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	2.8	12.2	J	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	7.1	30.8	J	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	3	13.0	J	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	1.4	5.96	J	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U J	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U J	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.76	3.74	J	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	2.3	11.3	J	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.11	0.66	J	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.29	1.74	J	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U J	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.21	1.56	J	0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U J	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.1	0.52	U J	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.9	4.42	J	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	3.6	12.7		0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	U	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	12.1			65 - 135		121%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	410945		6.63				
540-36-3	1,4-Difluorobenzene	1088100		8.31				
3114-55-4	Chlorobenzene-d5	648588		13.72				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road	Date Received:	09/13/13
Client Sample ID:	AIR001(913)DL	SDG No.:	E3697
Lab Sample ID:	E3697-01DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020961.D	10		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	1	4.94	UDQ	1.98	4.94	24.7	ug/m3
74-87-3	Chloromethane	1	2.07	UD	2.07	2.07	10.3	ug/m3
75-01-4	Vinyl Chloride	7.8	19.9	D	0.77	0.77	12.8	ug/m3
74-83-9	Bromomethane	1	3.88	UD	1.16	3.88	19.4	ug/m3
75-00-3	Chloroethane	1	2.64	UD	2.64	2.64	13.2	ug/m3
109-99-9	Tetrahydrofuran	1	2.95	UD	2.95	2.95	14.8	ug/m3
75-69-4	Trichlorofluoromethane	1	5.62	UD	2.25	5.62	28.1	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	1	7.66	UD	3.07	7.66	38.3	ug/m3
76-14-2	Dichlorotetrafluoroethane	1	6.99	UD	2.8	6.99	35.0	ug/m3
593-60-2	Bromoethene	1	4.37	UD	1.31	4.37	21.9	ug/m3
75-65-0	tert-Butyl alcohol	12.1	36.7	D	3.03	3.03	15.2	ug/m3
142-82-5	Heptane	1	4.1	UD	4.1	4.1	20.5	ug/m3
75-35-4	1,1-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-64-1	Acetone	69.2	164	DB	2.38	2.38	11.9	ug/m3
75-15-0	Carbon Disulfide	3.9	12.2	JD	1.56	3.11	15.6	ug/m3
1634-04-4	Methyl tert-Butyl Ether	1	3.61	UD	1.8	3.61	18.0	ug/m3
75-09-2	Methylene Chloride	5.6	19.4	DB	1.74	3.47	17.4	ug/m3
156-60-5	trans-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
75-34-3	1,1-Dichloroethane	1	4.05	UD	1.62	4.05	20.2	ug/m3
110-82-7	Cyclohexane	1	3.44	UD	3.44	3.44	17.2	ug/m3
78-93-3	2-Butanone	18.8	55.4	D	2.95	2.95	14.8	ug/m3
56-23-5	Carbon Tetrachloride	0.3	1.89	UD	1.89	1.89	31.4	ug/m3
156-59-2	cis-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-66-3	Chloroform	1	4.88	UD	0.98	4.88	24.4	ug/m3
71-55-6	1,1,1-Trichloroethane	0.3	1.64	UD	1.64	1.64	27.3	ug/m3
540-84-1	2,2,4-Trimethylpentane	1	4.67	UD	1.87	4.67	23.4	ug/m3
71-43-2	Benzene	1	3.19	UD	1.28	3.19	16.0	ug/m3
107-06-2	1,2-Dichloroethane	1	4.05	UD	4.05	4.05	20.2	ug/m3
79-01-6	Trichloroethene	0.3	1.61	UD	0.81	1.61	26.9	ug/m3
78-87-5	1,2-Dichloropropane	1	4.62	UD	4.62	4.62	23.1	ug/m3
75-27-4	Bromodichloromethane	1	6.7	UD	3.35	6.7	33.5	ug/m3
108-10-1	4-Methyl-2-Pentanone	1	4.1	UD	2.05	4.1	20.5	ug/m3
108-88-3	Toluene	1.9	7.16	JD	1.88	3.77	18.8	ug/m3
10061-02-6	t-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
10061-01-5	cis-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
79-00-5	1,1,2-Trichloroethane	1	5.46	UD	5.46	5.46	27.3	ug/m3
124-48-1	Dibromochloromethane	1	8.52	UD	4.26	8.52	42.6	ug/m3
106-93-4	1,2-Dibromoethane	1	7.69	UD	7.69	7.69	38.4	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road	Date Received:	09/13/13
Client Sample ID:	AIR001(913)DL	SDG No.:	E3697
Lab Sample ID:	E3697-01DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020961.D	10		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.3	2.03	UD	2.03	2.03	33.9	ug/m3
108-90-7	Chlorobenzene	1	4.61	UD	4.61	4.61	23.0	ug/m3
100-41-4	Ethyl Benzene	1	4.34	UD	4.34	4.34	21.7	ug/m3
179601-23-1	m/p-Xylene	1.8	7.82	JD	4.34	8.69	43.4	ug/m3
95-47-6	o-Xylene	1	4.34	UD	4.34	4.34	21.7	ug/m3
100-42-5	Styrene	1	4.26	UD	4.26	4.26	21.3	ug/m3
75-25-2	Bromoform	1	10.3	UD	5.17	10.3	51.7	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	1	6.87	UD	6.87	6.87	34.3	ug/m3
95-49-8	2-Chlorotoluene	1	5.18	UD	5.18	5.18	25.9	ug/m3
108-67-8	1,3,5-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
95-63-6	1,2,4-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
541-73-1	1,3-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
106-46-7	1,4-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
95-50-1	1,2-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
120-82-1	1,2,4-Trichlorobenzene	1	7.42	UD	2.97	7.42	37.1	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	1	10.7	UD	10.7	10.7	53.3	ug/m3
106-99-0	1,3-Butadiene	1	2.21	UD	2.21	2.21	11.1	ug/m3
91-20-3	Naphthalene	1	5.24	UD	2.1	5.24	26.2	ug/m3
622-96-8	4-Ethyltoluene	1	4.92	UD	4.92	4.92	24.6	ug/m3
110-54-3	Hexane	2	7.05	JD	1.41	3.52	17.6	ug/m3
107-05-1	Allyl Chloride	1	3.13	UD	1.57	3.13	15.6	ug/m3
123-91-1	1,4-Dioxane	1	3.6	UD	3.6	3.6	18.0	ug/m3
80-62-6	Methyl Methacrylate	1	4.09	UD	4.09	4.09	20.5	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.8			65 - 135		108%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	565357		6.62				
540-36-3	1,4-Difluorobenzene	1663340		8.29				
3114-55-4	Chlorobenzene-d5	1715050		13.71				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road Air	Date Received:	09/13/13
Client Sample ID:	AIR002(913)	SDG No.:	E3697
Lab Sample ID:	E3697-02	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020972.D	1		09/17/13	VL091713

CAS Number	Parameter		Conc. ppbv	Conc. ug/M3		Qualifier		MDL	LOD	LOQ / CRQL	Units
TARGETS											
75-71-8	Dichlorodifluoromethane		0.36	1.78		J~~Q~~		0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane		1.6	3.3				0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride		1.8	4.6				0.08	0.08	1.28	ug/m3
74-83-9	Bromomethane		0.1	0.39		U		0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane		0.28	0.74		J		0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran		4.1	12.1				0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane		0.53	2.98				0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane		0.11	0.84		J		0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane		0.1	0.7		U		0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene		0.1	0.44		U		0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	13.6	~~18.1~~	~~54.9~~	41.2	~~E~~	D	0.3	0.3	1.52	ug/m3
142-82-5	Heptane		2.3	9.43				0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene		0.1	0.4		U		0.2	0.4	1.98	ug/m3
67-64-1	Acetone	79.4	~~120~~	~~285~~	188	~~E~~	D	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide		6.5	20.2				0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether		0.1	0.36		U		0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride		8.5	29.5		~~B~~	J	0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene		0.1	0.4		U		0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane		0.14	0.57		J		0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane		0.1	0.34		U		0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	22.3	~~38.4~~	~~113~~	65.8	~~E~~	D	0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride		0.07	0.44		J		0.19	0.19	3.15	ug/m3
156-59-2	cis-1,2-Dichloroethene		0.1	0.4		U		0.2	0.4	1.98	ug/m3
67-66-3	Chloroform		0.1	0.49		U		0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane		0.03	0.16		U		0.16	0.16	2.73	ug/m3
540-84-1	2,2,4-Trimethylpentane		0.1	0.47		U		0.19	0.47	2.34	ug/m3
71-43-2	Benzene		1.7	5.43				0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane		0.52	2.1				0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene		0.27	1.45		J		0.11	0.16	2.69	ug/m3
78-87-5	1,2-Dichloropropane		0.1	0.46		U		0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane		0.1	0.67		U		0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone		0.38	1.56		J		0.2	0.41	2.05	ug/m3
108-88-3	Toluene		5.7	21.5				0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene		0.1	0.45		U		0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene		0.1	0.45		U		0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane		0.1	0.55		U		0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane		0.1	0.85		U		0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane		0.1	0.77		U		0.77	0.77	3.84	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road Air	Date Received:	09/13/13
Client Sample ID:	AIR002(913)	SDG No.:	E3697
Lab Sample ID:	E3697-02	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020972.D	1		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.27	1.83	J	0.2	0.2	3.39	ug/m3
108-90-7	Chlorobenzene	0.1	0.46	U J	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	2.7	11.7	J	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	7.5	32.6	J	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	3.3	14.3	J	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	1.5	6.39	J	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U J	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U J	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.77	3.79	J	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	2.9	14.3	J	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U J	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.29	1.74	J	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U J	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.38	2.82	J	0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U J	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.58	3.04	J	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.91	4.47	J	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	8.3	29.2		0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	U	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.5			65 - 135		105%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	417606		6.63				
540-36-3	1,4-Difluorobenzene	1161860		8.31				
3114-55-4	Chlorobenzene-d5	752928		13.72				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road	Date Received:	09/13/13
Client Sample ID:	AIR002(913)DL	SDG No.:	E3697
Lab Sample ID:	E3697-02DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020963.D	10		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	1	4.94	UDQ	1.98	4.94	24.7	ug/m3
74-87-3	Chloromethane	1.2	2.48	JD	2.07	2.07	10.3	ug/m3
75-01-4	Vinyl Chloride	1.2	3.07	JD	0.77	0.77	12.8	ug/m3
74-83-9	Bromomethane	1	3.88	UD	1.16	3.88	19.4	ug/m3
75-00-3	Chloroethane	1	2.64	UD	2.64	2.64	13.2	ug/m3
109-99-9	Tetrahydrofuran	1.7	5.01	JD	2.95	2.95	14.8	ug/m3
75-69-4	Trichlorofluoromethane	1	5.62	UD	2.25	5.62	28.1	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	1	7.66	UD	3.07	7.66	38.3	ug/m3
76-14-2	Dichlorotetrafluoroethane	1	6.99	UD	2.8	6.99	35.0	ug/m3
593-60-2	Bromoethene	1	4.37	UD	1.31	4.37	21.9	ug/m3
75-65-0	tert-Butyl alcohol	13.6	41.2	D	3.03	3.03	15.2	ug/m3
142-82-5	Heptane	1	4.1	JD	4.1	4.1	20.5	ug/m3
75-35-4	1,1-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-64-1	Acetone	79.4	188	DB	2.38	2.38	11.9	ug/m3
75-15-0	Carbon Disulfide	3.7	11.5	JD	1.56	3.11	15.6	ug/m3
1634-04-4	Methyl tert-Butyl Ether	1	3.61	UD	1.8	3.61	18.0	ug/m3
75-09-2	Methylene Chloride	9	31.3	DB	1.74	3.47	17.4	ug/m3
156-60-5	trans-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
75-34-3	1,1-Dichloroethane	1	4.05	UD	1.62	4.05	20.2	ug/m3
110-82-7	Cyclohexane	1	3.44	UD	3.44	3.44	17.2	ug/m3
78-93-3	2-Butanone	22.3	65.8	D	2.95	2.95	14.8	ug/m3
56-23-5	Carbon Tetrachloride	0.3	1.89	UD	1.89	1.89	31.4	ug/m3
156-59-2	cis-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-66-3	Chloroform	1	4.88	UD	0.98	4.88	24.4	ug/m3
71-55-6	1,1,1-Trichloroethane	0.3	1.64	UD	1.64	1.64	27.3	ug/m3
540-84-1	2,2,4-Trimethylpentane	1	4.67	UD	1.87	4.67	23.4	ug/m3
71-43-2	Benzene	1	3.19	UD	1.28	3.19	16.0	ug/m3
107-06-2	1,2-Dichloroethane	1	4.05	UD	4.05	4.05	20.2	ug/m3
79-01-6	Trichloroethene	0.3	1.61	UD	0.81	1.61	26.9	ug/m3
78-87-5	1,2-Dichloropropane	1	4.62	UD	4.62	4.62	23.1	ug/m3
75-27-4	Bromodichloromethane	1	6.7	UD	3.35	6.7	33.5	ug/m3
108-10-1	4-Methyl-2-Pentanone	1	4.1	UD	2.05	4.1	20.5	ug/m3
108-88-3	Toluene	2.3	8.67	JD	1.88	3.77	18.8	ug/m3
10061-02-6	t-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
10061-01-5	cis-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
79-00-5	1,1,2-Trichloroethane	1	5.46	UD	5.46	5.46	27.3	ug/m3
124-48-1	Dibromochloromethane	1	8.52	UD	4.26	8.52	42.6	ug/m3
106-93-4	1,2-Dibromoethane	1	7.69	UD	7.69	7.69	38.4	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road	Date Received:	09/13/13
Client Sample ID:	AIR002(913)DL	SDG No.:	E3697
Lab Sample ID:	E3697-02DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020963.D	10		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.3	2.03	UD	2.03	2.03	33.9	ug/m3
108-90-7	Chlorobenzene	1	4.61	UD	4.61	4.61	23.0	ug/m3
100-41-4	Ethyl Benzene	1	4.34	UD	4.34	4.34	21.7	ug/m3
179601-23-1	m/p-Xylene	2.1	9.12	JD	4.34	8.69	43.4	ug/m3
95-47-6	o-Xylene	1	4.34	UD	4.34	4.34	21.7	ug/m3
100-42-5	Styrene	1	4.26	UD	4.26	4.26	21.3	ug/m3
75-25-2	Bromoform	1	10.3	UD	5.17	10.3	51.7	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	1	6.87	UD	6.87	6.87	34.3	ug/m3
95-49-8	2-Chlorotoluene	1	5.18	UD	5.18	5.18	25.9	ug/m3
108-67-8	1,3,5-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
95-63-6	1,2,4-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
541-73-1	1,3-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
106-46-7	1,4-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
95-50-1	1,2-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.4	2.97	JD	2.97	7.42	37.1	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	1	10.7	UD	10.7	10.7	53.3	ug/m3
106-99-0	1,3-Butadiene	1	2.21	UD	2.21	2.21	11.1	ug/m3
91-20-3	Naphthalene	1	5.24	UD	2.1	5.24	26.2	ug/m3
622-96-8	4-Ethyltoluene	1	4.92	UD	4.92	4.92	24.6	ug/m3
110-54-3	Hexane	4.8	16.9	JD	1.41	3.52	17.6	ug/m3
107-05-1	Allyl Chloride	1	3.13	UD	1.57	3.13	15.6	ug/m3
123-91-1	1,4-Dioxane	1	3.6	UD	3.6	3.6	18.0	ug/m3
80-62-6	Methyl Methacrylate	1	4.09	UD	4.09	4.09	20.5	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.7			65 - 135		107%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	671895		6.62				
540-36-3	1,4-Difluorobenzene	1961850		8.29				
3114-55-4	Chlorobenzene-d5	2020100		13.71				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road Air	Date Received:	09/13/13
Client Sample ID:	AIR003(913)	SDG No.:	E3697
Lab Sample ID:	E3697-03	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020973.D	1		09/17/13	VL091713

CAS Number	Parameter		Conc. ppbv	Conc. ug/M3		Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS										
75-71-8	Dichlorodifluoromethane		0.63	3.12		~~Q~~ J	0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane		1.2	2.48			0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride		0.47	1.2		J	0.08	0.08	1.28	ug/m3
74-83-9	Bromomethane		0.1	0.39		U	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane		0.1	0.26		U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran		1.2	3.54			0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane		0.33	1.85		J	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane		0.12	0.92		J	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane		0.1	0.7		U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene		0.1	0.44		U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol		11.7	35.5			0.3	0.3	1.52	ug/m3
142-82-5	Heptane		1.1	4.51			0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene		0.1	0.4		U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	99.7	~~120~~	~~285~~	236	~~E~~ D	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide		3.4	10.6			0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether		0.1	0.36		U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	28.1	~~31.9~~	~~110~~	97.6	~~EB~~ DJ	0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene		0.1	0.4		U	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane		0.13	0.53		J	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane		0.1	0.34		U	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	15.9	~~21.9~~	~~64.6~~	46.9	~~E~~ D	0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride		0.11	0.69		J	0.19	0.19	3.15	ug/m3
156-59-2	cis-1,2-Dichloroethene		2.1	8.33			0.2	0.4	1.98	ug/m3
67-66-3	Chloroform		0.24	1.17		J	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane		0.03	0.16		U	0.16	0.16	2.73	ug/m3
540-84-1	2,2,4-Trimethylpentane		0.1	0.47		U	0.19	0.47	2.34	ug/m3
71-43-2	Benzene		1.4	4.47			0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane		0.1	0.4		U	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene		0.95	5.11			0.11	0.16	2.69	ug/m3
78-87-5	1,2-Dichloropropane		0.1	0.46		U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane		0.1	0.67		U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone		0.23	0.94		J	0.2	0.41	2.05	ug/m3
108-88-3	Toluene		3.6	13.6			0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene		0.1	0.45		U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene		0.1	0.45		U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane		0.1	0.55		U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane		0.1	0.85		U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane		0.1	0.77		U	0.77	0.77	3.84	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road Air	Date Received:	09/13/13
Client Sample ID:	AIR003(913)	SDG No.:	E3697
Lab Sample ID:	E3697-03	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020973.D	1		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.1	0.68	J	0.2	0.2	3.39	ug/m3
108-90-7	Chlorobenzene	0.1	0.46	U	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	1.3	5.65		0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	3.4	14.8		0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	1.5	6.52		0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.63	2.68		0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.38	1.87	J	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	1.4	6.88		0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.25	1.86	J	0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.38	1.99	J	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.39	1.92	J	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	27.2 ~~37.2~~	~~131~~ 95.9	~~E~~ D	0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	U	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	11.2			65 - 135		112%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	541586		6.63				
540-36-3	1,4-Difluorobenzene	1643550		8.31				
3114-55-4	Chlorobenzene-d5	1235140		13.72				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road	Date Received:	09/13/13
Client Sample ID:	AIR003(913)DL	SDG No.:	E3697
Lab Sample ID:	E3697-03DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020965.D	10		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.9	4.45	JDQ	1.98	4.94	24.7	ug/m3
74-87-3	Chloromethane	1.2	2.48	JD	2.07	2.07	10.3	ug/m3
75-01-4	Vinyl Chloride	0.4	1.02	JD	0.77	0.77	12.8	ug/m3
74-83-9	Bromomethane	1	3.88	UD	1.16	3.88	19.4	ug/m3
75-00-3	Chloroethane	1	2.64	UD	2.64	2.64	13.2	ug/m3
109-99-9	Tetrahydrofuran	1	2.95	UD	2.95	2.95	14.8	ug/m3
75-69-4	Trichlorofluoromethane	1	5.62	UD	2.25	5.62	28.1	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	1	7.66	UD	3.07	7.66	38.3	ug/m3
76-14-2	Dichlorotetrafluoroethane	1	6.99	UD	2.8	6.99	35.0	ug/m3
593-60-2	Bromoethene	1	4.37	UD	1.31	4.37	21.9	ug/m3
75-65-0	tert-Butyl alcohol	6.4	19.4	D	3.03	3.03	15.2	ug/m3
142-82-5	Heptane	1	4.1	UD	4.1	4.1	20.5	ug/m3
75-35-4	1,1-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-64-1	Acetone	99.7	236	DB	2.38	2.38	11.9	ug/m3
75-15-0	Carbon Disulfide	2.4	7.47	JD	1.56	3.11	15.6	ug/m3
1634-04-4	Methyl tert-Butyl Ether	1	3.61	UD	1.8	3.61	18.0	ug/m3
75-09-2	Methylene Chloride	28.1	97.6	DB	1.74	3.47	17.4	ug/m3
156-60-5	trans-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
75-34-3	1,1-Dichloroethane	1	4.05	UD	1.62	4.05	20.2	ug/m3
110-82-7	Cyclohexane	1	3.44	UD	3.44	3.44	17.2	ug/m3
78-93-3	2-Butanone	15.9	46.9	D	2.95	2.95	14.8	ug/m3
56-23-5	Carbon Tetrachloride	0.3	1.89	UD	1.89	1.89	31.4	ug/m3
156-59-2	cis-1,2-Dichloroethene	1.3	5.15	JD	1.98	3.96	19.8	ug/m3
67-66-3	Chloroform	1	4.88	UD	0.98	4.88	24.4	ug/m3
71-55-6	1,1,1-Trichloroethane	0.3	1.64	UD	1.64	1.64	27.3	ug/m3
540-84-1	2,2,4-Trimethylpentane	1	4.67	UD	1.87	4.67	23.4	ug/m3
71-43-2	Benzene	0.8	2.56	JD	1.28	3.19	16.0	ug/m3
107-06-2	1,2-Dichloroethane	1	4.05	UD	4.05	4.05	20.2	ug/m3
79-01-6	Trichloroethene	0.6	3.22	JD	0.81	1.61	26.9	ug/m3
78-87-5	1,2-Dichloropropane	1	4.62	UD	4.62	4.62	23.1	ug/m3
75-27-4	Bromodichloromethane	1	6.7	UD	3.35	6.7	33.5	ug/m3
108-10-1	4-Methyl-2-Pentanone	1	4.1	UD	2.05	4.1	20.5	ug/m3
108-88-3	Toluene	1.5	5.65	JD	1.88	3.77	18.8	ug/m3
10061-02-6	t-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
10061-01-5	cis-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
79-00-5	1,1,2-Trichloroethane	1	5.46	UD	5.46	5.46	27.3	ug/m3
124-48-1	Dibromochloromethane	1	8.52	UD	4.26	8.52	42.6	ug/m3
106-93-4	1,2-Dibromoethane	1	7.69	UD	7.69	7.69	38.4	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/13/13
Project:	ARC Horseshoe Road	Date Received:	09/13/13
Client Sample ID:	AIR003(913)DL	SDG No.:	E3697
Lab Sample ID:	E3697-03DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL020965.D	10		09/17/13	VL091713

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.3	2.03	UD	2.03	2.03	33.9	ug/m3
108-90-7	Chlorobenzene	1	4.61	UD	4.61	4.61	23.0	ug/m3
100-41-4	Ethyl Benzene	1	4.34	UD	4.34	4.34	21.7	ug/m3
179601-23-1	m/p-Xylene	1.3	5.65	JD	4.34	8.69	43.4	ug/m3
95-47-6	o-Xylene	1	4.34	UD	4.34	4.34	21.7	ug/m3
100-42-5	Styrene	1	4.26	UD	4.26	4.26	21.3	ug/m3
75-25-2	Bromoform	1	10.3	UD	5.17	10.3	51.7	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	1	6.87	UD	6.87	6.87	34.3	ug/m3
95-49-8	2-Chlorotoluene	1	5.18	UD	5.18	5.18	25.9	ug/m3
108-67-8	1,3,5-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
95-63-6	1,2,4-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
541-73-1	1,3-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
106-46-7	1,4-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
95-50-1	1,2-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.4	2.97	JD	2.97	7.42	37.1	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	1	10.7	UD	10.7	10.7	53.3	ug/m3
106-99-0	1,3-Butadiene	30.1	66.6	D	2.21	2.21	11.1	ug/m3
91-20-3	Naphthalene	1	5.24	UD	2.1	5.24	26.2	ug/m3
622-96-8	4-Ethyltoluene	1	4.92	UD	4.92	4.92	24.6	ug/m3
110-54-3	Hexane	27.2	95.9	D	1.41	3.52	17.6	ug/m3
107-05-1	Allyl Chloride	1	3.13	UD	1.57	3.13	15.6	ug/m3
123-91-1	1,4-Dioxane	1	3.6	UD	3.6	3.6	18.0	ug/m3
80-62-6	Methyl Methacrylate	1	4.09	UD	4.09	4.09	20.5	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.4			65 - 135		104%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	786967		6.62				
540-36-3	1,4-Difluorobenzene	2276540		8.29				
3114-55-4	Chlorobenzene-d5	2237440		13.7				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : E4915

Client Contact Information	Bottle Order ID : **B1312050**	Courier :	____ of ____ COCs
Client ID : **CREA02** Project ID : **ARC Horseshoe Road Air**		Sampler Name(s) : VA	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
Address : **215 Union Street**	Phone Number : **201-968-3304**		
	Fax Number : **2019683301**		
	Site Details: MID FLUENT	Batch Certified	
City : **Hackensack**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07601**	Standard : **15 business days** **OR**	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
AIR MID-002	12-23	8:59	9:59	-19	-3	59°	58°	-30		10555	10290 ~~10275~~	6 L	100	VL021130D VL021127.D								

Temperature (Fahrenheit)	Ambient	Maximum	Minimum	
Start	59°	59°	~~38°~~ 58	
Stop	58°	59°	~~38°~~ 58	

Pressure (Inches of Hg)	Ambient	Maximum	Minimum	
Start	29.97			
Stop	29.97			

GC/MS Analyst Signature (TO-15)

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: High ○ Medium ○ Low ○ PID Readings: ○

Sampling site (State): NJ

Quick Connector required : No

Canisters Shiped by:	Date/Time: 12/10/13	Canisters Received by:	Date/Time:		
Samples Relinquished by: VA	Date/Time: 12/23/13	Received by:	Date/Time: 12-23-13	1620	B1312050 - 1
Relinquished by:	Date/Time: 12-23-13	Received by:	Date/Time: 12-23-13		

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : E4915

Client Contact Information	Bottle Order ID : B1312050	Courier :	____ of ____ COCs
Client ID : CREA02 Project ID : ARC Horseshoe Road Air		Sampler Name(s) : VA	Analysis / Matrix
Customer Name : Creamer Environmental, Inc.	Project Manager Vincent albanese	AIR ANALYSIS CHAIN-OF-CUSTODY	
Address : 215 Union Street	Phone Number : 201-968-3304		
	Fax Number : 2019683301		
	Site Details: EFFLUENT	Batch Certified	
City : Hackensack			
State : NJ	Analysis Turnaround Time		
Zip Code : 07601	Standard : 15 business days OR	Data Package Type :	
Country : 12019683301	Rush (Specify): ____ Days	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
AIR EFF-002	12/23	8:55	10:00	-29	-4.5	59°	58	-30		10570	~~10298~~ 10293	6 L	100	VL021130.D								

Temperature (Fahrenheit)

	Ambient	Maximum	Minimum	
Start	59°	59°	~~38°~~ 58	
Stop	58°	59°	~~58°~~ 58	

Pressure (Inches of Hg)

	Ambient	Maximum	Minimum	
Start	29.97			
Stop	29.97			

GC/MS Analyst Signature (TO-15) [signature]

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments : 10784

Suspected Contamination: High ○ Medium ○ Low ○ PID Readings: 0 ppm

Sampling site (State): EFFLUENT NJ

Quick Connector required : NO

Canisters Shiped by: [signature]	Date/Time: 12/10/13	Canisters Received by:	Date/Time:
Samples Relinquished by: VA	Date/Time: 12/23/13	Received by: [signature]	Date/Time: 12-23-13 1620
Relinquished by: [signature]	Date/Time: 12-23-13 1705	Received by:	Date/Time:

B1312050 - 2

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : E4915

Client Contact Information		Bottle Order ID : B1312050	Courier :	____ of ____ COCs
Client ID : CREA02	Project ID : ARC Horseshoe Road Air		Sampler Name(s) : VA	Analysis / Matrix
Customer Name : Creamer Environmental, Inc.		Project Manager Vincent albanese	AIR ANALYSIS CHAIN-OF-CUSTODY	
Address : 215 Union Street		Phone Number : 201-968-3304		
		Fax Number : 2019683301		
		Site Details: INFLUENT	Batch Certified	
City : Hackensack				
State : NJ		Analysis Turnaround Time		
Zip Code : 07601		Standard : 15 business days OR	Data Package Type :	
Country : 12019683301		Rush (Specify): _____ Days	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15	Indoor/Ambinet Air	Soil Gas
AIR IN-002	12-23	8:56	1002	-29	-6	59°	58°	-30		10784	10275 ~~10293~~	6 L	100	VL021124 ~~VL021130.D~~			

Temperature (Fahrenheit)	Ambient	Maximum	Minimum
Start	59	59	58°
Stop	58°	59	58°

Pressure (Inches of Hg)	Ambient	Maximum	Minimum
Start	29.97		
Stop	29.97		

GC/MS Analyst Signature (TO-15)

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: High O Medium O Low O PID Readings:

Sampling site (State): NJ

Quick Connector required : NO

Canisters Shiped by:	Date/Time: 12/10/13	Canisters Received by:	Date/Time:		
Samples Relinquished by: VA	Date/Time: 12/23/13	Received by:	Date/Time: 12-23-13	1620	B1312050 - 3
Relinquished by:	Date/Time: 12-23-13 1205	Received by:	Date/Time:		

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-MID-002	SDG No.:	E4915
Lab Sample ID:	E4915-01	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021682.D	1		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.47	2.32	J	0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane	0.59	1.22		0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride	0.65	1.66		0.08	0.08	1.28	ug/m3
74-83-9	Bromomethane	0.1	0.39	U	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane	0.1	0.26	U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran	0.1	0.29	U	0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane	0.15	0.84	J	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	0.1	0.77	U	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane	0.1	0.7	U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene	0.1	0.44	U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	0.1	0.3	U	0.3	0.3	1.52	ug/m3
142-82-5	Heptane	0.12	0.49	J	0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	5	11.9	~~B~~	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide	0.1	0.31	U	0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether	0.1	0.36	U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	5.6	19.4		0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane	0.25	1.01	J	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane	0.1	0.34	U	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	0.83	2.45		0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride	0.03	0.19	J	0.19	0.19	3.15	ug/m3
156-59-2	cis-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-66-3	Chloroform	0.1	0.49	U	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane	0.03	0.16	U	0.16	0.16	2.73	ug/m3
540-84-1	2,2,4-Trimethylpentane	0.1	0.47	U	0.19	0.47	2.34	ug/m3
71-43-2	Benzene	0.12	0.38	J	0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane	0.1	0.4	U	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene	0.14	0.75	J	0.11	0.16	2.69	ug/m3
78-87-5	1,2-Dichloropropane	0.1	0.46	U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane	0.1	0.67	U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone	0.1	0.41	U	0.2	0.41	2.05	ug/m3
108-88-3	Toluene	0.84	3.17		0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane	0.1	0.55	U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane	0.1	0.85	U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane	0.1	0.77	U	0.77	0.77	3.84	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-MID-002	SDG No.:	E4915
Lab Sample ID:	E4915-01	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021682.D	1		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.04	0.27	J	0.2	0.2	3.39	ug/m3
108-90-7	Chlorobenzene	0.18	0.83	J	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	0.22	0.96	J	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	0.77	3.34	J	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	0.29	1.26	J	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.1	0.43	U	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	0.26	1.28	J	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	5.6	41.6		0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.19	1	J	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	2.1	7.4		0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	UQ	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.5			65 - 135		105%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	1824980		6.635				
540-36-3	1,4-Difluorobenzene	6205470		8.305				
3114-55-4	Chlorobenzene-d5	5159850		13.725				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-EFF-002	SDG No.:	E4915
Lab Sample ID:	E4915-02	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021684.D	1		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.48	2.37	J	0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane	0.67	1.38		0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride	2.7	6.9		0.08	0.08	1.28	ug/m3
74-83-9	Bromomethane	0.1	0.39	U	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane	0.1	0.26	U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran	0.1	0.29	U	0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane	0.06	0.34	J	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	0.1	0.77	U	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane	0.1	0.7	U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene	0.1	0.44	U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	0.1	0.3	U	0.3	0.3	1.52	ug/m3
142-82-5	Heptane	0.1	0.41	U	0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	1.3	3.09	~~B~~	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide	0.1	0.31	U	0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether	0.1	0.36	U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	2.4	8.34		0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane	0.1	0.4	U	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane	0.1	0.34	U	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	0.29	0.86	J	0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride	0.03	0.19	U	0.19	0.19	3.15	ug/m3
156-59-2	cis-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-66-3	Chloroform	0.1	0.49	U	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane	0.03	0.16	U	0.16	0.16	2.73	ug/m3
540-84-1	2,2,4-Trimethylpentane	0.1	0.47	U	0.19	0.47	2.34	ug/m3
71-43-2	Benzene	0.1	0.32	U	0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane	0.1	0.4	U	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene	0.26	1.4	J	0.11	0.16	2.69	ug/m3
78-87-5	1,2-Dichloropropane	0.1	0.46	U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane	0.1	0.67	U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone	0.1	0.41	U	0.2	0.41	2.05	ug/m3
108-88-3	Toluene	0.49	1.85	J	0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane	0.1	0.55	U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane	0.1	0.85	U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane	0.1	0.77	U	0.77	0.77	3.84	ug/m3

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-EFF-002	SDG No.:	E4915
Lab Sample ID:	E4915-02	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021684.D	1		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.03	0.2	U	0.2	0.2	3.39	ug/m3
108-90-7	Chlorobenzene	0.63	2.9		0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	0.24	1.04	J	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	0.12	0.52	J	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.1	0.43	U	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	0.23	1.13	J	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	12.5	92.8		0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.21	1.1	J	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	0.1	0.35	U	0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	UD	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.5			65 - 135		105%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	1759250		6.629				
540-36-3	1,4-Difluorobenzene	5863570		8.299				
3114-55-4	Chlorobenzene-d5	5189710		13.719				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-IN-002	SDG No.:	E4915
Lab Sample ID:	E4915-03	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021686.D	1		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.46	2.27	J	0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane	0.59	1.22		0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride	0.03	0.08	U	0.08	0.08	1.28	ug/m3
74-83-9	Bromomethane	0.1	0.39	U	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane	0.1	0.26	U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran	0.1	0.29	U	0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane	0.2	1.12	J	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	0.1	0.77	U	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane	0.1	0.7	U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene	0.1	0.44	U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	2.9	8.79		0.3	0.3	1.52	ug/m3
142-82-5	Heptane	0.22	0.9	J	0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	0.1	0.24	U	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide	0.1	0.31	U	0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether	0.1	0.36	U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	0.59	2.05		0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane	0.1	0.4	U	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane	17.4 ~~19.7~~	~~67.8~~ 59.9	~~E~~ D	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	0.65	1.92		0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride	0.06	0.38	J	0.19	0.19	3.15	ug/m3
156-59-2	cis-1,2-Dichloroethene	0.34	1.35	J	0.2	0.4	1.98	ug/m3
67-66-3	Chloroform	0.1	0.49	U	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane	0.03	0.16	U	0.16	0.16	2.73	ug/m3
540-84-1	2,2,4-Trimethylpentane	28.1 ~~24.2~~	~~113~~ 131	~~E~~ D	0.19	0.47	2.34	ug/m3
71-43-2	Benzene	0.24	0.77	J	0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane	0.1	0.4	U	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene	0.21	1.13	J	0.11	0.16	2.69	ug/m3
78-87-5	1,2-Dichloropropane	0.1	0.46	U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane	0.1	0.67	U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone	0.1	0.41	U	0.2	0.41	2.05	ug/m3
108-88-3	Toluene	0.7	2.64		0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane	0.1	0.55	U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane	0.1	0.85	U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane	0.1	0.77	U	0.77	0.77	3.84	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-IN-002	SDG No.:	E4915
Lab Sample ID:	E4915-03	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021686.D	1		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.06	0.41	J	0.2	0.2	3.39	ug/m3
108-90-7	Chlorobenzene	0.21	0.97	J	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	0.28	1.22	J	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.1	0.43	U	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	3.3	24.5		0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.1	0.52	U	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	7.5	26.4		0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	UQ	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.4			65 - 135		104%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	1848430		6.629				
540-36-3	1,4-Difluorobenzene	6538120		8.305				
3114-55-4	Chlorobenzene-d5	5813830		13.725				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-IN-002DL	SDG No.:	E4915
Lab Sample ID:	E4915-03DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021687.D	10		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	1	4.94	UD	1.98	4.94	24.7	ug/m3
74-87-3	Chloromethane	1	2.07	UD	2.07	2.07	10.3	ug/m3
75-01-4	Vinyl Chloride	0.3	0.77	UD	0.77	0.77	12.8	ug/m3
74-83-9	Bromomethane	1	3.88	UD	1.16	3.88	19.4	ug/m3
75-00-3	Chloroethane	1	2.64	UD	2.64	2.64	13.2	ug/m3
109-99-9	Tetrahydrofuran	1	2.95	UD	2.95	2.95	14.8	ug/m3
75-69-4	Trichlorofluoromethane	1	5.62	UD	2.25	5.62	28.1	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	1	7.66	UD	3.07	7.66	38.3	ug/m3
76-14-2	Dichlorotetrafluoroethane	1	6.99	UD	2.8	6.99	35.0	ug/m3
593-60-2	Bromoethene	1	4.37	UD	1.31	4.37	21.9	ug/m3
75-65-0	tert-Butyl alcohol	3	9.09	JD	3.03	3.03	15.2	ug/m3
142-82-5	Heptane	1	4.1	UD	4.1	4.1	20.5	ug/m3
75-35-4	1,1-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-64-1	Acetone	1	2.38	UD	2.38	2.38	11.9	ug/m3
75-15-0	Carbon Disulfide	1	3.11	UD	1.56	3.11	15.6	ug/m3
1634-04-4	Methyl tert-Butyl Ether	1	3.61	UD	1.8	3.61	18.0	ug/m3
75-09-2	Methylene Chloride	1	3.47	UD	1.74	3.47	17.4	ug/m3
156-60-5	trans-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
75-34-3	1,1-Dichloroethane	1	4.05	UD	1.62	4.05	20.2	ug/m3
110-82-7	Cyclohexane	17.4	59.9	D	3.44	3.44	17.2	ug/m3
78-93-3	2-Butanone	1	2.95	UD	2.95	2.95	14.8	ug/m3
56-23-5	Carbon Tetrachloride	0.3	1.89	UD	1.89	1.89	31.4	ug/m3
156-59-2	cis-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-66-3	Chloroform	1	4.88	UD	0.98	4.88	24.4	ug/m3
71-55-6	1,1,1-Trichloroethane	0.3	1.64	UD	1.64	1.64	27.3	ug/m3
540-84-1	2,2,4-Trimethylpentane	28.1	131	D	1.87	4.67	23.4	ug/m3
71-43-2	Benzene	1	3.19	UD	1.28	3.19	16.0	ug/m3
107-06-2	1,2-Dichloroethane	1	4.05	UD	4.05	4.05	20.2	ug/m3
79-01-6	Trichloroethene	0.3	1.61	UD	0.81	1.61	26.9	ug/m3
78-87-5	1,2-Dichloropropane	1	4.62	UD	4.62	4.62	23.1	ug/m3
75-27-4	Bromodichloromethane	1	6.7	UD	3.35	6.7	33.5	ug/m3
108-10-1	4-Methyl-2-Pentanone	1	4.1	UD	2.05	4.1	20.5	ug/m3
108-88-3	Toluene	1	3.77	UD	1.88	3.77	18.8	ug/m3
10061-02-6	t-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
10061-01-5	cis-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
79-00-5	1,1,2-Trichloroethane	1	5.46	UD	5.46	5.46	27.3	ug/m3
124-48-1	Dibromochloromethane	1	8.52	UD	4.26	8.52	42.6	ug/m3
106-93-4	1,2-Dibromoethane	1	7.69	UD	7.69	7.69	38.4	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	12/23/13
Project:	ARC Horseshoe Road Air	Date Received:	12/23/13
Client Sample ID:	AIR-IN-002DL	SDG No.:	E4915
Lab Sample ID:	E4915-03DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL021687.D	10		12/26/13	VL122613

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.3	2.03	UD	2.03	2.03	33.9	ug/m3
108-90-7	Chlorobenzene	1	4.61	UD	4.61	4.61	23.0	ug/m3
100-41-4	Ethyl Benzene	1	4.34	UD	4.34	4.34	21.7	ug/m3
179601-23-1	m/p-Xylene	2	8.69	UD	4.34	8.69	43.4	ug/m3
95-47-6	o-Xylene	1	4.34	UD	4.34	4.34	21.7	ug/m3
100-42-5	Styrene	1	4.26	UD	4.26	4.26	21.3	ug/m3
75-25-2	Bromoform	1	10.3	UD	5.17	10.3	51.7	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	1	6.87	UD	6.87	6.87	34.3	ug/m3
95-49-8	2-Chlorotoluene	1	5.18	UD	5.18	5.18	25.9	ug/m3
108-67-8	1,3,5-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
95-63-6	1,2,4-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
541-73-1	1,3-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
106-46-7	1,4-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
95-50-1	1,2-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
120-82-1	1,2,4-Trichlorobenzene	1.8	13.4	JD	2.97	7.42	37.1	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	1	10.7	UD	10.7	10.7	53.3	ug/m3
106-99-0	1,3-Butadiene	1	2.21	UD	2.21	2.21	11.1	ug/m3
91-20-3	Naphthalene	1	5.24	UD	2.1	5.24	26.2	ug/m3
622-96-8	4-Ethyltoluene	1	4.92	UD	4.92	4.92	24.6	ug/m3
110-54-3	Hexane	6	21.2	D	1.41	3.52	17.6	ug/m3
107-05-1	Allyl Chloride	1	3.13	UD	1.57	3.13	15.6	ug/m3
123-91-1	1,4-Dioxane	1	3.6	UDQ	3.6	3.6	18.0	ug/m3
80-62-6	Methyl Methacrylate	1	4.09	UD	4.09	4.09	20.5	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	11			65 - 135		110%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	1984320		6.629				
540-36-3	1,4-Difluorobenzene	7053830		8.299				
3114-55-4	Chlorobenzene-d5	6224540		13.719				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : _____

Client Contact Information	Bottle Order ID : **B1402015**	Courier :	_____ of _____ COCs
Client ID : **CREA02** Project ID :	**ARC Horseshoe Road Air**	Sampler Name(s) :	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
Address : **12 Old Bridge Road**	Phone Number : **201-968-3304**		
	Fax Number : **2019683301**		
	Site Details: INFLUENT 004	Batch Certified	
City : **Cedar Grove**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07009**	Standard : **15 business days** **OR**	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
	3/10	800	910	-35	-4			-30	-18	10637	10275	6 L	100	VL021815.D								

Temperature (Fahrenheit)	Ambient	Maximum	Minimum	
Start				
Stop				

Pressure (Inches of Hg)	Ambient	Maximum	Minimum	
Start				
Stop				

GC/MS Analyst Signature (TO-15)

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: High Medium Low PID Readings:

Sampling site (State):

Quick Connector required : No

Canisters Shiped by:	Date/Time: 02/12/14	Canisters Received by:	Date/Time: 3-10-14 1305
Samples Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time: 3-10-14 1345	Received by:	Date/Time: 3-10-14 1344

B1402015 - 1

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : _____

Client Contact Information	Bottle Order ID : **B1402015**	Courier :	_____ of _____ COCs
Client ID : **CREA02** Project ID : **ARC Horseshoe Road Air**		Sampler Name(s) :	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
	Phone Number : **201-968-3304**		
Address : **12 Old Bridge Road**	Fax Number : **2019683301**	Batch Certified	
	Site Details: MIDFLUENT 004		
City : **Cedar Grove**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07009**	Standard : **15 business days** **OR**	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
MID 004	3/10	800	910	-21.5	-15			-30	-3.5	10107	10290	6 L	100	VL021815.D								

Temperature (Fahrenheit)	Ambient	Maximum	Minimum	
Start				
Stop				

Pressure (Inches of Hg)	Ambient	Maximum	Minimum	
Start				
Stop				

GC/MS Analyst Signature (TO-15)

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: High Medium Low PID Readings:

Sampling site (State):

Quick Connector required : No

Canisters Shiped by: Sally	Date/Time: 02/12/14	Canisters Received by:	Date/Time: 3-10-14 1305
Samples Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time: 3-10-14 1345	Received by:	Date/Time: 3-10-14 13:44.

B1402015 - 2

CHEMTECH

284 Sheffield Street, Mountainside, New Jersey 07092 Phone : 908 789 8900 Fax : 908 789 89

CHEMTECH Project No. : _____

Client Contact Information	Bottle Order ID : **B1402015**	Courier :	_____ of _____ COCs
Client ID : **CREA02** Project ID :	**ARC Horseshoe Road Air**	Sampler Name(s) :	Analysis / Matrix
Customer Name : **Creamer Environmental, Inc.**	Project Manager **Vincent albanese**	AIR ANALYSIS CHAIN-OF-CUSTODY	
Address : **12 Old Bridge Road**	Phone Number : **201-968-3304**		
	Fax Number : **2019683301**		
	Site Details: EFFLUENT 004	Batch Certified	
City : **Cedar Grove**			
State : **NJ**	Analysis Turnaround Time		
Zip Code : **07009**	Standard : **15 business days** **OR**	Data Package Type :	
Country : **12019683301**	Rush (Specify): _____ **Days**	EDD Type :	

Sample Identification	Sample Date(s)	Time Start (24 hr Clock)	Time Stop (24 hr Clock)	Can Vacuum in Field ("Hg) (Start)	Can Vacuum in Field ("Hg) (Stop)**	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Out going Can Pressure ("Hg)(Lab)	In coming Can Pressure ("Hg)(Lab)	Flow Reg. ID	Can ID	Can Size (L)	Flow Controller Readout	Can Cert ID	TO-15				Indoor/Ambinet Air	Soil Gas		
EFF-004	3/10	800	910	-28	-3.5			-30	-4.3	10586	10440	6 L	100	VL021815.D								

Temperature (Fahrenheit)	Ambient	Maximum	Minimum	
Start				
Stop				

Pressure (Inches of Hg)	Ambient	Maximum	Minimum	
Start				
Stop				

GC/MS Analyst Signature (TO-15) [signature]

** Submittal of this COC indicates approval of the analysis based on existing conditio

Please follow the instructions on the back of this CO

Special Instructions/QC Requirements & Comments :

Suspected Contamination: High Medium Low PID Readings:

Sampling site (State):

Quick Connector required : No

Canisters Shiped by: [signature]	Date/Time: 02/10/14	Canisters Received by: [signature]	Date/Time: 3-10-14 1305
Samples Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by: [signature]	Date/Time: 3-10-14 1345	Received by: CW	Date/Time: 3-10-14

B1402015 - 3

B.44

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	INF004	SDG No.:	F1600
Lab Sample ID:	F1600-01	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022416.D	1		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.58	2.87		0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane	0.56	1.16		0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride	0.59	1.51		0.08	0.08	0.08	ug/m3
74-83-9	Bromomethane	0.23	0.89	J	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane	0.1	0.26	U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran	0.19	0.56	J	0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane	0.28	1.57	J	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	0.09	0.69	J	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane	0.1	0.7	U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene	0.1	0.44	U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	0.1	0.3	U	0.3	0.3	1.52	ug/m3
142-82-5	Heptane	0.1	0.41	U	0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	5.3	12.6	UB	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide	0.1	0.31	U	0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether	0.1	0.36	U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	0.64	2.22		0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene	0.15	0.59	J	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane	0.22	0.89	J	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane	0.1	0.34	U	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	0.63	1.86		0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride	0.07	0.44		0.19	0.19	0.19	ug/m3
156-59-2	cis-1,2-Dichloroethene	8.8	34.9		0.2	0.4	1.98	ug/m3
67-66-3	Chloroform	0.1	0.49	U	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane	0.03	0.16	U	0.16	0.16	0.16	ug/m3
540-84-1	2,2,4-Trimethylpentane	0.1	0.47	U	0.19	0.47	2.34	ug/m3
71-43-2	Benzene	0.46	1.47	J	0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane	0.22	0.89	J	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene	1.9	10.2		0.11	0.16	0.16	ug/m3
78-87-5	1,2-Dichloropropane	0.1	0.46	U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane	0.1	0.67	U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone	0.1	0.41	U	0.2	0.41	2.05	ug/m3
108-88-3	Toluene	1.3	4.9		0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane	0.1	0.55	U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane	0.1	0.85	U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane	0.1	0.77	U	0.77	0.77	3.84	ug/m3

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	INF004	SDG No.:	F1600
Lab Sample ID:	F1600-01	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022416.D	1		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.03	0.2	U	0.2	0.2	0.2	ug/m3
108-90-7	Chlorobenzene	1.7	7.83		0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	0.2	0.87	U	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.1	0.43	U	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.16	0.96	J	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.33	1.98	J	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	2.5	18.6		0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.1	0.52	U	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	0.1	0.35	U	0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	U	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	11			65 - 135		110%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	720781		6.7				
540-36-3	1,4-Difluorobenzene	2468760		8.37				
3114-55-4	Chlorobenzene-d5	2297730		13.8				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	MID004	SDG No.:	F1600
Lab Sample ID:	F1600-02	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022414.D	1		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.46	2.27	J	0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane	0.73	1.51		0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride	0.57	1.46		0.08	0.08	0.08	ug/m3
74-83-9	Bromomethane	0.1	0.39	U	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane	0.1	0.26	U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran	5.4	15.9		0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane	0.19	1.07	J	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	0.1	0.77	U	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane	0.1	0.7	U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene	0.1	0.44	U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	0.1	0.3	U	0.3	0.3	1.52	ug/m3
142-82-5	Heptane	0.1	0.41	U	0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	20.8 ~~18.5~~	~~44.0~~ 49.4	~~E~~ D	0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide	0.1	0.31	U	0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether	0.1	0.36	U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	2.5	8.69	UB	0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane	0.1	0.4	U	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane	0.1	0.34	U	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	6.8	20.1		0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride	0.03	0.19		0.19	0.19	0.19	ug/m3
156-59-2	cis-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-66-3	Chloroform	0.1	0.49	U	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane	0.03	0.16	U	0.16	0.16	0.16	ug/m3
540-84-1	2,2,4-Trimethylpentane	0.1	0.47	U	0.19	0.47	2.34	ug/m3
71-43-2	Benzene	0.16	0.51	J	0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane	0.1	0.4	U	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene	0.03	0.16	U	0.11	0.16	0.16	ug/m3
78-87-5	1,2-Dichloropropane	0.1	0.46	U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane	0.1	0.67	U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone	0.1	0.41	U	0.2	0.41	2.05	ug/m3
108-88-3	Toluene	0.32	1.21	J	0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane	0.1	0.55	U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane	0.1	0.85	U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane	0.1	0.77	U	0.77	0.77	3.84	ug/m3

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	MID004	SDG No.:	F1600
Lab Sample ID:	F1600-02	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022414.D	1		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.03	0.2	U	0.2	0.2	0.2	ug/m3
108-90-7	Chlorobenzene	0.1	0.46	U	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	0.2	0.87	U	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.1	0.43	U	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.93	6.9		0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.1	0.52	U	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	0.1	0.35	U	0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	U	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	11			65 - 135		110%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	720645		6.7				
540-36-3	1,4-Difluorobenzene	2461010		8.37				
3114-55-4	Chlorobenzene-d5	2314300		13.8				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	MID004DL	SDG No.:	F1600
Lab Sample ID:	F1600-02DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022415.D	10		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	1	4.94	UD	1.98	4.94	24.7	ug/m3
74-87-3	Chloromethane	1	2.07	UD	2.07	2.07	10.3	ug/m3
75-01-4	Vinyl Chloride	0.3	0.77	UD	0.77	0.77	0.77	ug/m3
74-83-9	Bromomethane	1	3.88	UD	1.16	3.88	19.4	ug/m3
75-00-3	Chloroethane	1	2.64	UD	2.64	2.64	13.2	ug/m3
109-99-9	Tetrahydrofuran	4.6	13.6	JD	2.95	2.95	14.8	ug/m3
75-69-4	Trichlorofluoromethane	1	5.62	UD	2.25	5.62	28.1	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	1	7.66	UD	3.07	7.66	38.3	ug/m3
76-14-2	Dichlorotetrafluoroethane	1	6.99	UD	2.8	6.99	35.0	ug/m3
593-60-2	Bromoethene	1	4.37	UD	1.31	4.37	21.9	ug/m3
75-65-0	tert-Butyl alcohol	1	3.03	UD	3.03	3.03	15.2	ug/m3
142-82-5	Heptane	1	4.1	UD	4.1	4.1	20.5	ug/m3
75-35-4	1,1-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-64-1	Acetone	20.8	49.4	D	2.38	2.38	11.9	ug/m3
75-15-0	Carbon Disulfide	1	3.11	UD	1.56	3.11	15.6	ug/m3
1634-04-4	Methyl tert-Butyl Ether	1	3.61	UD	1.8	3.61	18.0	ug/m3
75-09-2	Methylene Chloride	1	3.47	UD	1.74	3.47	17.4	ug/m3
156-60-5	trans-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
75-34-3	1,1-Dichloroethane	1	4.05	UD	1.62	4.05	20.2	ug/m3
110-82-7	Cyclohexane	1	3.44	UD	3.44	3.44	17.2	ug/m3
78-93-3	2-Butanone	6.3	18.6	D	2.95	2.95	14.8	ug/m3
56-23-5	Carbon Tetrachloride	0.3	1.89	UD	1.89	1.89	1.89	ug/m3
156-59-2	cis-1,2-Dichloroethene	1	3.96	UD	1.98	3.96	19.8	ug/m3
67-66-3	Chloroform	1	4.88	UD	0.98	4.88	24.4	ug/m3
71-55-6	1,1,1-Trichloroethane	0.3	1.64	UD	1.64	1.64	1.64	ug/m3
540-84-1	2,2,4-Trimethylpentane	1	4.67	UD	1.87	4.67	23.4	ug/m3
71-43-2	Benzene	1	3.19	UD	1.28	3.19	16.0	ug/m3
107-06-2	1,2-Dichloroethane	1	4.05	UD	4.05	4.05	20.2	ug/m3
79-01-6	Trichloroethene	0.3	1.61	UD	0.81	1.61	1.61	ug/m3
78-87-5	1,2-Dichloropropane	1	4.62	UD	4.62	4.62	23.1	ug/m3
75-27-4	Bromodichloromethane	1	6.7	UD	3.35	6.7	33.5	ug/m3
108-10-1	4-Methyl-2-Pentanone	1	4.1	UD	2.05	4.1	20.5	ug/m3
108-88-3	Toluene	1	3.77	UD	1.88	3.77	18.8	ug/m3
10061-02-6	t-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
10061-01-5	cis-1,3-Dichloropropene	1	4.54	UD	4.54	4.54	22.7	ug/m3
79-00-5	1,1,2-Trichloroethane	1	5.46	UD	5.46	5.46	27.3	ug/m3
124-48-1	Dibromochloromethane	1	8.52	UD	4.26	8.52	42.6	ug/m3
106-93-4	1,2-Dibromoethane	1	7.69	UD	7.69	7.69	38.4	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	MID004DL	SDG No.:	F1600
Lab Sample ID:	F1600-02DL	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022415.D	10		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.3	2.03	UD	2.03	2.03	2.03	ug/m3
108-90-7	Chlorobenzene	1	4.61	UD	4.61	4.61	23.0	ug/m3
100-41-4	Ethyl Benzene	1	4.34	UD	4.34	4.34	21.7	ug/m3
179601-23-1	m/p-Xylene	2	8.69	UD	4.34	8.69	43.4	ug/m3
95-47-6	o-Xylene	1	4.34	UD	4.34	4.34	21.7	ug/m3
100-42-5	Styrene	1	4.26	UD	4.26	4.26	21.3	ug/m3
75-25-2	Bromoform	1	10.3	UD	5.17	10.3	51.7	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	1	6.87	UD	6.87	6.87	34.3	ug/m3
95-49-8	2-Chlorotoluene	1	5.18	UD	5.18	5.18	25.9	ug/m3
108-67-8	1,3,5-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
95-63-6	1,2,4-Trimethylbenzene	1	4.92	UD	4.92	4.92	24.6	ug/m3
541-73-1	1,3-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
106-46-7	1,4-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
95-50-1	1,2-Dichlorobenzene	1	6.01	UD	6.01	6.01	30.1	ug/m3
120-82-1	1,2,4-Trichlorobenzene	1	7.42	UD	2.97	7.42	37.1	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	1	10.7	UD	10.7	10.7	53.3	ug/m3
106-99-0	1,3-Butadiene	1	2.21	UD	2.21	2.21	11.1	ug/m3
91-20-3	Naphthalene	1	5.24	UD	2.1	5.24	26.2	ug/m3
622-96-8	4-Ethyltoluene	1	4.92	UD	4.92	4.92	24.6	ug/m3
110-54-3	Hexane	1	3.52	UD	1.41	3.52	17.6	ug/m3
107-05-1	Allyl Chloride	1	3.13	UD	1.57	3.13	15.6	ug/m3
123-91-1	1,4-Dioxane	1	3.6	UD	3.6	3.6	18.0	ug/m3
80-62-6	Methyl Methacrylate	1	4.09	UD	4.09	4.09	20.5	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.8			65 - 135		108%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	705043		6.7				
540-36-3	1,4-Difluorobenzene	2451380		8.37				
3114-55-4	Chlorobenzene-d5	2350050		13.8				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	EFF004	SDG No.:	F1600
Lab Sample ID:	F1600-03	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022412.D	1		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
75-71-8	Dichlorodifluoromethane	0.76	3.76		0.2	0.49	2.47	ug/m3
74-87-3	Chloromethane	0.61	1.26		0.21	0.21	1.03	ug/m3
75-01-4	Vinyl Chloride	0.77	1.97		0.08	0.08	0.08	ug/m3
74-83-9	Bromomethane	0.1	0.39	U	0.12	0.39	1.94	ug/m3
75-00-3	Chloroethane	0.1	0.26	U	0.26	0.26	1.32	ug/m3
109-99-9	Tetrahydrofuran	0.56	1.65		0.29	0.29	1.47	ug/m3
75-69-4	Trichlorofluoromethane	0.1	0.56	U	0.22	0.56	2.81	ug/m3
76-13-1	1,1,2-Trichlorotrifluoroethane	0.1	0.77	U	0.31	0.77	3.83	ug/m3
76-14-2	Dichlorotetrafluoroethane	0.1	0.7	U	0.28	0.7	3.49	ug/m3
593-60-2	Bromoethene	0.1	0.44	U	0.13	0.44	2.19	ug/m3
75-65-0	tert-Butyl alcohol	0.1	0.3	U	0.3	0.3	1.52	ug/m3
142-82-5	Heptane	0.1	0.41	U	0.41	0.41	2.05	ug/m3
75-35-4	1,1-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-64-1	Acetone	2.8	6.65		0.24	0.24	1.19	ug/m3
75-15-0	Carbon Disulfide	0.1	0.31	U	0.16	0.31	1.56	ug/m3
1634-04-4	Methyl tert-Butyl Ether	0.1	0.36	U	0.18	0.36	1.8	ug/m3
75-09-2	Methylene Chloride	1.3	4.52	UB	0.17	0.35	1.74	ug/m3
156-60-5	trans-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
75-34-3	1,1-Dichloroethane	0.1	0.4	U	0.16	0.4	2.02	ug/m3
110-82-7	Cyclohexane	0.1	0.34	U	0.34	0.34	1.72	ug/m3
78-93-3	2-Butanone	1.3	3.83		0.29	0.29	1.47	ug/m3
56-23-5	Carbon Tetrachloride	0.03	0.19	U	0.19	0.19	0.19	ug/m3
156-59-2	cis-1,2-Dichloroethene	0.1	0.4	U	0.2	0.4	1.98	ug/m3
67-66-3	Chloroform	0.1	0.49	U	0.1	0.49	2.44	ug/m3
71-55-6	1,1,1-Trichloroethane	0.03	0.16	U	0.16	0.16	0.16	ug/m3
540-84-1	2,2,4-Trimethylpentane	0.1	0.47	U	0.19	0.47	2.34	ug/m3
71-43-2	Benzene	0.05	0.16	J	0.13	0.32	1.6	ug/m3
107-06-2	1,2-Dichloroethane	0.1	0.4	U	0.4	0.4	2.02	ug/m3
79-01-6	Trichloroethene	0.03	0.16	U	0.11	0.16	0.16	ug/m3
78-87-5	1,2-Dichloropropane	0.1	0.46	U	0.46	0.46	2.31	ug/m3
75-27-4	Bromodichloromethane	0.1	0.67	U	0.33	0.67	3.35	ug/m3
108-10-1	4-Methyl-2-Pentanone	0.1	0.41	U	0.2	0.41	2.05	ug/m3
108-88-3	Toluene	0.1	0.38	U	0.19	0.38	1.88	ug/m3
10061-02-6	t-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
10061-01-5	cis-1,3-Dichloropropene	0.1	0.45	U	0.45	0.45	2.27	ug/m3
79-00-5	1,1,2-Trichloroethane	0.1	0.55	U	0.55	0.55	2.73	ug/m3
124-48-1	Dibromochloromethane	0.1	0.85	U	0.43	0.85	4.26	ug/m3
106-93-4	1,2-Dibromoethane	0.1	0.77	U	0.77	0.77	3.84	ug/m3

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road Air	Date Received:	03/10/14
Client Sample ID:	EFF004	SDG No.:	F1600
Lab Sample ID:	F1600-03	Matrix:	Air
Analytical Method:	TO-15	Test:	VOCMS Group2
Sample Wt/Vol:	400 Units: mL		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VL022412.D	1		03/11/14	VL031014

CAS Number	Parameter	Conc. ppbv	Conc. ug/M3	Qualifier	MDL	LOD	LOQ / CRQL	Units
127-18-4	Tetrachloroethene	0.03	0.2	U	0.2	0.2	0.2	ug/m3
108-90-7	Chlorobenzene	0.1	0.46	U	0.46	0.46	2.3	ug/m3
100-41-4	Ethyl Benzene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
179601-23-1	m/p-Xylene	0.2	0.87	U	0.43	0.87	4.34	ug/m3
95-47-6	o-Xylene	0.1	0.43	U	0.43	0.43	2.17	ug/m3
100-42-5	Styrene	0.1	0.43	U	0.43	0.43	2.13	ug/m3
75-25-2	Bromoform	0.1	1.03	U	0.52	1.03	5.17	ug/m3
79-34-5	1,1,2,2-Tetrachloroethane	0.1	0.69	U	0.69	0.69	3.43	ug/m3
95-49-8	2-Chlorotoluene	0.1	0.52	U	0.52	0.52	2.59	ug/m3
108-67-8	1,3,5-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
95-63-6	1,2,4-Trimethylbenzene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
541-73-1	1,3-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
106-46-7	1,4-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
95-50-1	1,2-Dichlorobenzene	0.1	0.6	U	0.6	0.6	3.01	ug/m3
120-82-1	1,2,4-Trichlorobenzene	0.1	0.74	U	0.3	0.74	3.71	ug/m3
87-68-3	Hexachloro-1,3-Butadiene	0.1	1.07	U	1.07	1.07	5.33	ug/m3
106-99-0	1,3-Butadiene	0.1	0.22	U	0.22	0.22	1.11	ug/m3
91-20-3	Naphthalene	0.1	0.52	U	0.21	0.52	2.62	ug/m3
622-96-8	4-Ethyltoluene	0.1	0.49	U	0.49	0.49	2.46	ug/m3
110-54-3	Hexane	0.1	0.35	U	0.14	0.35	1.76	ug/m3
107-05-1	Allyl Chloride	0.1	0.31	U	0.16	0.31	1.57	ug/m3
123-91-1	1,4-Dioxane	0.1	0.36	U	0.36	0.36	1.8	ug/m3
80-62-6	Methyl Methacrylate	0.1	0.41	U	0.41	0.41	2.05	ug/m3
SURROGATES								
460-00-4	1-Bromo-4-Fluorobenzene	10.9			65 - 135		109%	SPK: 10
INTERNAL STANDARDS								
74-97-5	Bromochloromethane	732486		6.7				
540-36-3	1,4-Difluorobenzene	2516310		8.37				
3114-55-4	Chlorobenzene-d5	2312700		13.8				

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
D = Dilution

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
Q = indicates LCS control criteria did not meet requirements

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB, EPH, Metals and Miscellaneous Analyses

SDGs #E3984, E4502 and F1175

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #21743R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # E3984, E4502 and F1175 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PEST/ PCB	MET	MISC
E3984	BF007(100413)	E3984-07	Soil	10/04/13		X	X	X	X	X
E4502	BF011(111413)	E4502-02	Soil	11/14/13		X	X	X	X	X
F1175	BF013(011714)	F1175-01	Soil	01/17/14		X	X	X	X	X

Note:

1. Miscellaneous analyses include EPH, Cyanide and Radiochemistry.

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods SOM01.2_VOC, SVOC, PEST, PCB, SW846 8260, SW846 8270 and EPH. Data were reviewed in accordance with the method specified criteria and USEPA National Functional Guidelines of June 2008.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2	Water	14 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2
	Soil	14 days from collection to analysis	Cool to <6°C; preserved with sodium bisulfate

s.u. Standard units

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, trip, 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. Trip blanks measure contamination of samples during shipment. Rinse blanks measure contamination of samples during field operations.

All compounds associated with the QA blanks exhibited a concentration less than the MDL
All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with the following sample locations were qualified.

Sample Locations	Compounds	Blank Result	Sample Result	Qualification
BF013(011714)	Methylene chloride	<RL[1]	Detected sample results <RL	UB at the RL

Notes
RL = reporting limit is equal to the low point of the initial calibration curve.
1 = two times the RL for methylene chloride, 2-butanone and acetone.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 15 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and a RRF value greater than control limit (0.05). All compounds listed in Table 15 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 15 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (25%) and a RRF value greater than control limit (0.05). All target compounds associated with the closing continuing calibration standard must exhibit a percent difference (%D) less than the control limit (50%) and RRF value greater than control limit (0.01).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
BF007(100413) BF011(111413) BF013(011714)	ICV RRF	1,4-Dioxane	0.002
	CCV RRF	1,4-Dioxane	0.002

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Opening/Closing	Criteria	Sample Result	Qualification
Initial Calibration	NA	RRF <0.05/<0.01[1]	Non-detect	R
			Detect	J
Continuing Calibration	Opening	RRF <0.05/<0.01[1]	Non-detect	R
			Detect	J
	Closing	RRF <0.01	Non-detect	R
			Detect	J
Initial Calibration	NA	%RSD > 20/40[1]%	Non-detect	UJ
			Detect	J
Continuing Calibration	Opening	%D >25/40[1]%	Non-detect	UJ
			Detect	J
	Closing	%D >50%	Non-detect	UJ
			Detect	J

1. Target compounds listed in Table 3 of the SOM NFG.

2. Minimum RRF for 1,4-dioxane and 1,4-dixoane-d8 is 0.005.
3. Note: The compound 1,4-Dioxane exhibited calibration an RRF value <0.005. However, upon further review of the calibration standard area counts and chromatographs it was determined that if the compound was present in the associated field samples, the compound would have been reported as detected. Therefore the associated sample results have been qualified as estimated and not rejected based on professional judgment.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not included with these SDGs.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: CLP SOM01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Storage blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
DMC Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X	X		
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

VOCs: CLP SOM01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

VOLATILE ORGANIC COMPOUND (VOC) 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 8260	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2 s.u.
	Soil	48 hours from collection to extraction and 14 days from extraction to analysis	Cool to <6 °C.

s.u. Standard units

All samples were analyzed within the specified holding time criteria.

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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
BF007(100413)	ICV %RSD	Tert butyl alcohol	37.7%
		Acrolein	26.1%
	CCV %D	Tert butyl alcohol	-27.78%
		Acrolein	-22.58%
BF013(011714)	ICV %RSD	Tert butyl alcohol	16.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery
BF011(111413)	Benzo(a)pyrene	>UL

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. 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 water matrices and 100% 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 two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with these SDGs.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
D. Method blanks		X		X	
E. Equipment blanks		X		X	
F. Trip blanks		X		X	
Laboratory Control Sample (LCS)		X	X		
Laboratory Control Sample Duplicate(LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)		X		X	
Matrix Spike Duplicate(MSD)		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Lab Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X	X		
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
F. Reconstructed ion chromatograms		X		X	
G. Quantitation Reports		X		X	
H. RT of sample compounds within the established RT windows		X		X	
I. Transcription/calculation errors present		X		X	

VOCs: SW-846 8260	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
J. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

SEMI-VOLATILE VOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2 SVOC SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction 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.

No compounds were detected above the MDL in the associated blanks.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 28 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and an RRF value greater than control limit (0.05). All compounds listed in Table 28 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 28 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (25%) and RRF value greater than control limit (0.05). All target compounds not listed associated with the closing continuing calibration standard must exhibit a percent difference (%D) less than the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC to exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compounds concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

A MS/MSD was not performed on a sample location within this SDG.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not included with these SDGs.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: CLP SOM01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) 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 8270	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
BF007(100413)	CCV %D	Benzidine	28.8%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis exhibited acceptable recoveries.

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
BF007(100413)	n-Nitrosodimethylamine
	Azobenzene
	Benzidine
	Benzo(a)pyrene
	Dibenz(a,h)anthracene

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits.

9. 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 water matrices and 100% 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 two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

A field duplicate was not included with these SDGs.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
G. Method blanks		X		X	
H. 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	
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
K. Reconstructed ion chromatograms		X		X	
L. Quantitation Reports		X		X	
M. RT of sample compounds within the established RT windows		X		X	
N. Quantitation transcriptions/calculations		X		X	
O. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

PESTICIDES ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

The instrument performance checks are performed to ensure adequate resolution and instrument sensitivity.

3.1 Resolution Check Mixture

The resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 80% for all analytes on the primary column and greater than or equal to 50% for the confirmation column when one Individual Standard Mixture (C) is used. If two Individual Standard Mixtures (A and B) are used, the resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 60%.

3.2 Performance Evaluation Mixture (PEM)

The resolution between any two adjacent peaks in the Performance Evaluation Mixture (PEM) must be greater than or equal to 90% on each column. In addition, the percent breakdown of 4,4'-DDT and Endrin in the PEMs must each be less than or equal to 20% for each column and the combined percent breakdown must be less than or equal to 30% on each column.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of

acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The maximum RSD allowed is 20% for all target compounds with the exception of 25% for alpha-BHC and delta-BHC and 30% for toxaphene.

4.2 Continuing Calibration

All target compounds associated with the Performance Evaluation Mixture (PEM) must exhibit a percent difference (%D) less than the control limit (25%). All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) for the calibration factor less than the control limit (20%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. Pesticides analysis requires the two pesticides surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit a RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Florisil Cartridge Performance Check

The performance of each lot of Florisil cartridges used for sample cleanup must be checked at least once, or every six months. The performance check is acceptable if the recovery of the target pesticide

compounds and surrogates in the Individual Standard Mixture (A) are 80 to 120% and the recovery limit for 2,4,5-trichlorophenol is less than 5%.

The performance check recoveries were within acceptable limits.

9. Gel Permeation Chromatography Performance Analysis

The GPC check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the recoveries of the pesticides in the GPC continuing calibration verification solution are within 80 to 110%.

The GPC calibration recoveries were within acceptable limits.

10. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not included with these SDGs.

11. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must less than 25%.

The dual column analysis exhibited acceptable %D.

12. 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 VALIDATION CHECKLIST FOR PESTICIDES

PESTICIDES: CLP SOM01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate(LCSD)					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS)		X	X		
Matrix Spike Duplicate(MSD)		X	X		
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Column %D $\leq$ 25%		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/confirmation		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% for each peak is allowed. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All peaks associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%). The closing continuing calibration standard must exhibit a %D less than the control limit (50%)

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires the surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
BF013(011714)	Aroclor 1016

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the method established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Gel Permeation Chromatography Performance Analysis

The GPC calibration check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the resolution of the phthalate and methoxychlor peaks in the GPC calibration mixture are greater than 85% and the perylene and sulfur peaks greater than 90% baseline resolution.

The GPC calibration resolution is acceptable.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not included with these SDGs.

10. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must be less than 25%.

The dual column analysis exhibited acceptable %D.

11. 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 VALIDATION CHECKLIST FOR PCBs

PCBs: CLP SOM01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate(MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Column (%D)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

EXTRACTABLE PETROLEUM HYDROCARBON ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
EPH by Method NJ DEP	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C.
	Water	14 days from collection to extraction and 40 days from extraction 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% or a correlation coefficient of greater than 0.99 is allowed. VPH-EPH 25%

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%). VPH-EPH 25%

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
BF013(011714)	1-chlorooctadecane	< LL but > 10%

Lower control limit (LL)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
BF007(100413)	AromaticC12-C16	>UL	>UL
	AromaticC16-C21	>UL	AC
BF011(111413)	Aliphatic C9-C12	<LL but >10%	AC

AC Acceptable

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration (D).	Detect	No Action
	Non-detect	

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows.

All identified compounds met the specified criteria.

10. 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 VALIDATION CHECKLIST FOR EPH

NJ DEP EPH	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/FID)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R					X
LCS/LCSD Precision (RPD)					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
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3 and 903.1. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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.

All analytes associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the analytes listed in the following table. Sample results associated with QA blank contamination that were greater than the BAL resulted in the removal of the laboratory qualifier (J) of data. Sample results less than the BAL associated with the following sample locations were qualified as listed in the following table.

Sample Locations	Analytes	Sample Result	Qualification
BF011(111413)	Barium Beryllium	Detected sample results <RL and <BAL	“UB” at the RL

RL = reporting limit

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument’s continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard

analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

The MS analysis exhibited recoveries within the control limits.

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not included with these SDGs.

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution exhibited %D within the control limit.

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 VALIDATION CHECKLIST FOR METAL

METALS: CLP ISM01.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP)					
Tier II Validation					
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
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution		X		X	
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

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
Cyanide by SW-846 9012	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of greater than 12.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte 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.

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

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All analytes associated with the initial and continuing calibrations were within the specified control limits. The correct frequency and type of standards were analyzed.

4. Matrix Spike (MS) / Laboratory Duplicate Analyses

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

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

The MS analysis exhibited recoveries within the control limits.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample results exhibited RPD within the control limit.

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 recoveries between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

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 VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA Lloyd-Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
I. Method blanks		X		X	
J. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted for sample dilutions		X		X	

%RSD – relative standard deviation
%R – percent recovery
RPD – relative percent difference
%D – difference

RADIOCHEMISTRY ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
Method 903.1	Soil	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.

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 (common laboratory contaminant compounds are calculated at ten times) 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 RL in the associated blanks; therefore detected sample results were not associated with blank contamination.

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. 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 qualifier will be removed.

The MS analysis exhibited recoveries within the control limits.

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 CRDL. 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 CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

The laboratory duplicate recoveries exhibited acceptable RPD.

4. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy 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 was not analyzed on a sample within this data set.

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%.

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 VALIDATION CHECKLIST FOR RADIOCHEMISTRY

RAD; PAI 713 rev 10	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP)					
Tier II Validation					
Holding Times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Instrument Blanks					X
B. Method Blanks		X		X	
C. Equipment/Field Blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
Reporting Limit Verification		X		X	
Raw Data		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Jeffrey L. Davin

SIGNATURE:

DATE: May 27, 2014

PEER REVIEW: Dennis Capria

DATE: July 17, 2014

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH

CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E3984
QUOTE NO.
COC Number 030660

2461

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: Creamer Environmental
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC HorseShoe RD
PROJECT NO.: 12-2260 LOCATION: Sayreville
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalki@Creamerenvironmental
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union Street
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO 10 DAY
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 TCL VOC
2 TCL SVOC
3 TAL Metals
4 Cyanide + MERC
5 TCL Pest + PCB
6 ra-226
7 EPH-Cat 1
8 Hex Chrom
9 SPIP Metals

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
1.	BF007(100313)	Soil		X	10/3			X	X	X	X	X	X	X	X	X	
2.	BF008(100313)	Soil		X	10/3			X	X	X	X	X	X	X	X	X	
3.	BF009(100313)	Soil		X	10/3			X	X	X	X	X	X	X	X	X	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

PRESERVATIVES

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. A. Vassell	10/3/13 11:00 AM	1. L. Carter 1430
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. L. Carter	1510 10.3.13	3. Shelly Mehta

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: HOLD Hex Chrom and SPIP Metals

Cooler Temp. 5°C
Ice in Cooler?: yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
E3984

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E3984
QUOTE NO.
COC Number 030260

261

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: Creamer Environmental
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC - Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYREVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@creamerenvironmental
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

TCL - VOC gr. 1

PRESERVATIVES

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 (E)	2	3	4	5	6	7	8	9	COMMENTS
1. 7	BF007 (100413)	Soil		X	10/4	1200	3	X									
2. 8	BF009 (100413)	Soil		X	10/4	1200	3	X									
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	10/4 1410	1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 10/4/13 1510	RECEIVED FOR LAB BY: 3. Sneha Mehta

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 4°C
Ice in Cooler?: _____

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
E3984

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following " Results Qualifiers" are used:

J Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).

U Indicates the analyte was analyzed for, but not detected.

ND Indicates the analyte was analyzed for, but not detected

E Indicates the reported value is estimated because of the presence of interference

M Indicates Duplicate injection precision not met.

N Indicates the spiked sample recovery is not within control limits.

S Indicates the reported value was determined by the Method of Standard Addition (MSA).

***** Indicates that the duplicate analysis is not within control limits.

+ Indicates the correlation coefficient for the MSA is less than 0.995.

D Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

M Method qualifiers
"P" for ICP instrument
"PM" for ICP when Microwave Digestion is used
"CV" for Manual Cold Vapor AA
"AV" for automated Cold Vapor AA
"CA" for MIDI-Distillation Spectrophotometric
"AS" for Semi –Automated Spectrophotometric
"C" for Manual Spectrophotometric
"T" for Titrimetric
"NR" for analyte not required to be analyzed

OR Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.

Q Indicates the LCS did not meet the control limits requirements

H Sample Analysis Out Of Hold Time

DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following " Results Qualifiers" are used:

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
ND	Indicates the analyte was analyzed for, but not detected
J	Indicates an estimated value. This flag is used: (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.) (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others.
B	Indicates the analyte was found in the blank as well as the sample report as "12 B".
E	Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P".
N	This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.
A	This flag indicates that a Tentatively Identified Compound is a suspected aldol-condensation product.
Q	Indicates the LCS did not meet the control limits requirements

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/04/13
Project:	ARC Horseshoe Road	Date Received:	10/04/13
Client Sample ID:	BF007(100413)	SDG No.:	E3984
Lab Sample ID:	E3984-07	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	4
Sample Wt/Vol:	4.49 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VT006722.D	1		10/07/13	VT100713

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	2.9	U	1.8	2.9	5.8	ug/Kg
74-87-3	Chloromethane	2.9	U	0.7	2.9	5.8	ug/Kg
75-01-4	Vinyl chloride	2.9	U	1.2	2.9	5.8	ug/Kg
74-83-9	Bromomethane	2.9	U	1.4	2.9	5.8	ug/Kg
75-00-3	Chloroethane	2.9	U	0.92	2.9	5.8	ug/Kg
75-69-4	Trichlorofluoromethane	2.9	U	1.2	2.9	5.8	ug/Kg
75-35-4	1,1-Dichloroethene	2.9	U	1.2	2.9	5.8	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	2.9	U	0.86	2.9	5.8	ug/Kg
67-64-1	Acetone	6.9	J	3.2	6	12	ug/Kg
75-15-0	Carbon disulfide	2.9	U	0.59	2.9	5.8	ug/Kg
79-20-9	Methyl Acetate	2.9	U	0.78	2.9	5.8	ug/Kg
75-09-2	Methylene chloride	4.6	J	1.3	2.9	5.8	ug/Kg
156-60-5	trans-1,2-Dichloroethene	2.9	U	0.68	2.9	5.8	ug/Kg
1634-04-4	Methyl tert-butyl Ether	2.9	U	0.84	2.9	5.8	ug/Kg
75-34-3	1,1-Dichloroethane	2.9	U	0.8	2.9	5.8	ug/Kg
156-59-2	cis-1,2-Dichloroethene	2.9	U	0.65	2.9	5.8	ug/Kg
78-93-3	2-Butanone	6	U	2.2	6	12	ug/Kg
74-97-5	Bromochloromethane	2.9	U	0.79	2.9	5.8	ug/Kg
67-66-3	Chloroform	2.9	U	1.1	2.9	5.8	ug/Kg
71-55-6	1,1,1-Trichloroethane	2.9	U	0.73	2.9	5.8	ug/Kg
110-82-7	Cyclohexane	2.9	U	0.83	2.9	5.8	ug/Kg
56-23-5	Carbon tetrachloride	2.9	U	1.1	2.9	5.8	ug/Kg
71-43-2	Benzene	2.9	U	0.99	2.9	5.8	ug/Kg
107-06-2	1,2-Dichloroethane	2.9	U	0.93	2.9	5.8	ug/Kg
123-91-1	1,4-Dioxane	60	U J	58	60	120	ug/Kg
79-01-6	Trichloroethene	2.9	U	1.3	2.9	5.8	ug/Kg
108-87-2	Methylcyclohexane	2.9	U	1	2.9	5.8	ug/Kg
78-87-5	1,2-Dichloropropane	2.9	U	1.3	2.9	5.8	ug/Kg
75-27-4	Bromodichloromethane	2.9	U	0.8	2.9	5.8	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	2.9	U	1	2.9	5.8	ug/Kg
108-10-1	4-Methyl-2-pentanone	6	U	2	6	12	ug/Kg

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/04/13
Project:	ARC Horseshoe Road	Date Received:	10/04/13
Client Sample ID:	BF007(100413)	SDG No.:	E3984
Lab Sample ID:	E3984-07	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	4
Sample Wt/Vol:	4.49 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VT006722.D	1		10/07/13	VT100713

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-88-3	Toluene	2.9	U	0.67	2.9	5.8	ug/Kg
10061-02-6	trans-1,3-Dichloropropene	2.9	U	0.82	2.9	5.8	ug/Kg
79-00-5	1,1,2-Trichloroethane	2.9	U	1.4	2.9	5.8	ug/Kg
127-18-4	Tetrachloroethene	2.9	U	0.93	2.9	5.8	ug/Kg
591-78-6	2-Hexanone	6	U	2.9	6	12	ug/Kg
124-48-1	Dibromochloromethane	2.9	U	1.2	2.9	5.8	ug/Kg
106-93-4	1,2-Dibromoethane	2.9	U	0.78	2.9	5.8	ug/Kg
108-90-7	Chlorobenzene	2.9	U	0.98	2.9	5.8	ug/Kg
100-41-4	Ethylbenzene	2.9	U	1.1	2.9	5.8	ug/Kg
95-47-6	o-xylene	2.9	U	1.3	2.9	5.8	ug/Kg
179601-23-1	m&p-xylenes	2.9	U	0.71	2.9	5.8	ug/Kg
100-42-5	Styrene	2.9	U	0.92	2.9	5.8	ug/Kg
75-25-2	Bromoform	2.9	U	1.1	2.9	5.8	ug/Kg
98-82-8	Isopropylbenzene	2.9	U	0.7	2.9	5.8	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	2.9	U	0.76	2.9	5.8	ug/Kg
541-73-1	1,3-Dichlorobenzene	2.9	U	1.1	2.9	5.8	ug/Kg
106-46-7	1,4-Dichlorobenzene	2.9	U	0.87	2.9	5.8	ug/Kg
95-50-1	1,2-Dichlorobenzene	2.9	U	0.71	2.9	5.8	ug/Kg
96-12-8	1,2-Dibromo-3-chloropropane	2.9	U	2	2.9	5.8	ug/Kg
120-82-1	1,2,4-trichlorobenzene	2.9	U	1.8	2.9	5.8	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	2.9	U	2.1	2.9	5.8	ug/Kg
1330-20-7	Total Xylenes	6	U	2	6	12	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	48.7		68 - 122		97%	SPK: 50
19199-91-8	Chloroethane-d5	49.5		61 - 130		99%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	35.6		45 - 132		71%	SPK: 50
24313-50-6	2-Butanone-d5	85.1		20 - 182		85%	SPK: 100
865-49-6	Chloroform-d	43.8		72 - 123		88%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	47.9		79 - 122		96%	SPK: 50
1076-43-3	Benzene-d6	50.3		80 - 121		101%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	46		74 - 124		92%	SPK: 50
2037-26-5	Toluene-d8	45.2		78 - 121		90%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/04/13
Project:	ARC Horseshoe Road	Date Received:	10/04/13
Client Sample ID:	BF007(100413)	SDG No.:	E3984
Lab Sample ID:	E3984-07	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	4
Sample Wt/Vol:	4.49 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VT006722.D	1		10/07/13	VT100713

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
93951-86-1	trans-1,3-Dichloropropene-d4	39.2		72 - 130		78%	SPK: 50
4840-82-8	2-Hexanone-d5	76.8		17 - 184		77%	SPK: 100
17647-74-4	1,4-Dioxane-d8	612		50 - 150		61%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	41.5		56 - 161		83%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	47.9		70 - 131		96%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	597179	11.22				
540-36-3	1,4-Difluorobenzene	681283	8.38				
3855-82-1	1,4-Dichlorobenzene-d4	289658	13.16				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/04/13
Project:	ARC Horseshoe Road	Date Received:	10/04/13
Client Sample ID:	BF007(100413)	SDG No.:	E3984
Lab Sample ID:	E3984-07	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	4.3
Sample Wt/Vol:	4.94 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group2
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VD039316.D	1		10/09/13	VD100813

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-65-0	Tert butyl alcohol	26.4	U J	7.8	26.4	26.4	ug/Kg
107-02-8	Acrolein	26.4	U J	4.2	26.4	26.4	ug/Kg
107-13-1	Acrylonitrile	2.6	U	2.6	2.6	26.4	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	40.3		56 - 120		81%	SPK: 50
1868-53-7	Dibromofluoromethane	45.6		57 - 135		91%	SPK: 50
2037-26-5	Toluene-d8	47.5		67 - 123		95%	SPK: 50
460-00-4	4-Bromofluorobenzene	48.9		33 - 141		98%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	662688	6.5				
540-36-3	1,4-Difluorobenzene	791605	7.62				
3114-55-4	Chlorobenzene-d5	732595	11.8				
3855-82-1	1,4-Dichlorobenzene-d4	481585	14.17				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	4
Sample Wt/Vol:	30.05 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 4.92

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG011319.D	1	10/03/13	10/05/13	PB72627

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
100-52-7	Benzaldehyde	90	U	12	90	180	ug/Kg
108-95-2	Phenol	90	U	22	90	180	ug/Kg
111-44-4	Bis(2-chloroethyl)ether	90	U	21	90	180	ug/Kg
95-57-8	2-Chlorophenol	90	U	18	90	180	ug/Kg
95-48-7	2-Methylphenol	90	U	30	90	180	ug/Kg
108-60-1	2,2-Oxybis(1-chloropropane)	90	U	16	90	180	ug/Kg
98-86-2	Acetophenone	90	U	20	90	180	ug/Kg
65794-96-9	3+4-Methylphenol	90	U	23	90	180	ug/Kg
621-64-7	N-Nitroso-di-n-propylamine	90	U	23	90	180	ug/Kg
67-72-1	Hexachloroethane	90	U	21	90	180	ug/Kg
98-95-3	Nitrobenzene	90	U	19	90	180	ug/Kg
78-59-1	Isophorone	90	U	30	90	180	ug/Kg
105-67-9	2,4-Dimethylphenol	90	U	35	90	180	ug/Kg
111-91-1	Bis(2-chloroethoxy)methane	90	U	29	90	180	ug/Kg
120-83-2	2,4-Dichlorophenol	90	U	30	90	180	ug/Kg
91-20-3	Naphthalene	90	U	35	90	180	ug/Kg
87-68-3	Hexachlorobutadiene	90	U	35	90	180	ug/Kg
105-60-2	Caprolactam	90	U	21	90	180	ug/Kg
91-57-6	2-Methylnaphthalene	90	U	30	90	180	ug/Kg
77-47-4	Hexachlorocyclopentadiene	90	U	66	90	180	ug/Kg
88-06-2	2,4,6-Trichlorophenol	90	U	55	90	180	ug/Kg
95-95-4	2,4,5-Trichlorophenol	90	U	41	90	180	ug/Kg
92-52-4	1,1-Biphenyl	90	U	43	90	180	ug/Kg
91-58-7	2-Chloronaphthalene	90	U	34	90	180	ug/Kg
88-74-4	2-Nitroaniline	170	U	26	170	340	ug/Kg
131-11-3	Dimethylphthalate	210		50	90	180	ug/Kg
606-20-2	2,6-Dinitrotoluene	90	U	32	90	180	ug/Kg
208-96-8	Acenaphthylene	90	U	38	90	180	ug/Kg
83-32-9	Acenaphthene	90	U	44	90	180	ug/Kg
51-28-5	2,4-Dinitrophenol	170	U	66	170	340	ug/Kg
132-64-9	Dibenzofuran	90	U	45	90	180	ug/Kg

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	4
Sample Wt/Vol:	30.05 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 4.92

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG011319.D	1	10/03/13	10/05/13	PB72627

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
121-14-2	2,4-Dinitrotoluene	90	U	35	90	180	ug/Kg
84-66-2	Diethylphthalate	90	U	54	90	180	ug/Kg
86-73-7	Fluorene	90	U	44	90	180	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	170	U	26	170	340	ug/Kg
86-30-6	N-Nitrosodiphenylamine	90	U	42	90	180	ug/Kg
118-74-1	Hexachlorobenzene	90	U	47	90	180	ug/Kg
1912-24-9	Atrazine	90	U	62	90	180	ug/Kg
87-86-5	Pentachlorophenol	170	U	73	170	340	ug/Kg
85-01-8	Phenanthrene	90	U	49	90	180	ug/Kg
120-12-7	Anthracene	90	U	48	90	180	ug/Kg
86-74-8	Carbazole	90	U	47	90	180	ug/Kg
84-74-2	Di-n-butylphthalate	90	U	45	90	180	ug/Kg
206-44-0	Fluoranthene	90	U	52	90	180	ug/Kg
129-00-0	Pyrene	90	U	53	90	180	ug/Kg
85-68-7	Butylbenzylphthalate	90	U	49	90	180	ug/Kg
91-94-1	3,3-Dichlorobenzidine	90	U	31	90	180	ug/Kg
56-55-3	Benzo(a)anthracene	90	U	53	90	180	ug/Kg
218-01-9	Chrysene	90	U	54	90	180	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	90	U	57	90	180	ug/Kg
117-84-0	Di-n-octylphthalate	90	U	59	90	180	ug/Kg
205-99-2	Benzo(b)fluoranthene	90	U	74	90	180	ug/Kg
207-08-9	Benzo(k)fluoranthene	90	U	60	90	180	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	90	U	53	90	180	ug/Kg
191-24-2	Benzo(g,h,i)perylene	90	U	55	90	180	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	90	U	21	90	180	ug/Kg
SURROGATES							
4165-62-2	Phenol-d5	17.7		17 - 103		44%	SPK: 40
93952-02-4	Bis(2-Chloroethyl)ether-d8	17.2		12 - 98		43%	SPK: 40
93951-73-6	2-Chlorophenol-d4	18.2		13 - 101		45%	SPK: 40
190780-66-6	4-Methylphenol-d8	18.2		8 - 100		46%	SPK: 40
4165-60-0	Nitrobenzene-d5	17.1		16 - 103		43%	SPK: 40
93951-78-1	2-Nitrophenol-d4	16.7		16 - 104		42%	SPK: 40

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	4
Sample Wt/Vol:	30.05 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 4.92

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG011319.D	1	10/03/13	10/05/13	PB72627

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
93951-74-7	2,4-Dichlorophenol-d3	18.2		23 - 104		46%	SPK: 40
191656-33-4	4-Chloroaniline-d4	17		1 - 145		43%	SPK: 40
85448-30-2	Dimethylphthalate-d6	17.8		43 - 111		44%	SPK: 40
93951-97-4	Acenaphthylene-d8	18.2		20 - 97		45%	SPK: 40
93951-79-2	4-Nitrophenol-d4	11.8		16 - 166		29%	SPK: 40
81103-79-9	Fluorene-d10	18.2		40 - 108		45%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	12.2		1 - 121		30%	SPK: 40
1719-06-8	Anthracene-d10	18.8		22 - 98		47%	SPK: 40
1718-52-1	Pyrene-d10	19.9	*	51 - 120		50%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	18		43 - 111		45%	SPK: 40

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	188017	6.49
1146-65-2	Naphthalene-d8	774610	8.61
15067-26-2	Acenaphthene-d10	589610	11.55
1517-22-2	Phenanthrene-d10	1200520	14.01
1719-03-5	Chrysene-d12	1326730	18.36
1520-96-3	Perylene-d12	1190510	21.34

U = Not Detected
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MDL = Method Detection Limit
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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	4.3
Sample Wt/Vol:	30.09 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group2
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065916.D	1	10/04/13	10/07/13	PB72673

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	69.5	U J	17.8	69.5	340	ug/Kg
103-33-3	Azobenzene	34.7	U J	8.1	34.7	340	ug/Kg
92-87-5	Benzidine	69.5	U J	34.9	69.5	340	ug/Kg
50-32-8	Benzo(a)pyrene	34.7	U J	7.5	34.7	340	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	34.7	U J	10	34.7	340	ug/Kg
SURROGATES							
4165-60-0	Nitrobenzene-d5	67.9		31 - 132		68%	SPK: 100
321-60-8	2-Fluorobiphenyl	64.9		39 - 123		65%	SPK: 100
1718-51-0	Terphenyl-d14	64.9		37 - 115		65%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	72508	5.54				
1146-65-2	Naphthalene-d8	279102	6.79				
15067-26-2	Acenaphthene-d10	164848	8.51				
1517-22-2	Phenanthrene-d10	284405	9.98				
1719-03-5	Chrysene-d12	240656	12.59				
1520-96-3	Perylene-d12	225505	13.9				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
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CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	4.3 Decanted:
Sample Wt/Vol:	30.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 4.92		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PD019423.D	1	10/03/13	10/04/13	PB72626

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.9	U	0.13	0.9	1.8	ug/Kg
319-85-7	beta-BHC	0.9	U	0.14	0.9	1.8	ug/Kg
58-89-9	gamma-BHC	0.9	U	0.12	0.9	1.8	ug/Kg
76-44-8	Heptachlor	0.9	U	0.13	0.9	1.8	ug/Kg
309-00-2	Aldrin	0.9	U	0.1	0.9	1.8	ug/Kg
1024-57-3	Heptachlor epoxide	0.9	U	0.12	0.9	1.8	ug/Kg
959-98-8	Endosulfan I	0.9	U	0.14	0.9	1.8	ug/Kg
60-57-1	Dieldrin	1.7	U	0.63	1.7	3.4	ug/Kg
72-55-9	4,4-DDE	1.7	U	0.097	1.7	3.4	ug/Kg
72-20-8	Endrin	1.7	U	0.094	1.7	3.4	ug/Kg
33213-65-9	Endosulfan II	1.7	U	0.088	1.7	3.4	ug/Kg
72-54-8	4,4-DDD	1.7	U	0.098	1.7	3.4	ug/Kg
1031-07-8	Endosulfan Sulfate	1.7	U	0.075	1.7	3.4	ug/Kg
50-29-3	4,4-DDT	1.7	U	0.089	1.7	3.4	ug/Kg
72-43-5	Methoxychlor	9	U	0.081	9	18	ug/Kg
53494-70-5	Endrin ketone	1.7	U	0.098	1.7	3.4	ug/Kg
7421-93-4	Endrin aldehyde	1.7	U	0.15	1.7	3.4	ug/Kg
5103-71-9	alpha-Chlordane	0.9	U	0.1	0.9	1.8	ug/Kg
5103-74-2	gamma-Chlordane	0.9	U	0.094	0.9	1.8	ug/Kg
8001-35-2	Toxaphene	90	U	34	90	180	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	46		30 - 150		77%	SPK: 60
2051-24-3	Decachlorobiphenyl	86.7		30 - 150		72%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	4.3 Decanted:
Sample Wt/Vol:	30.09 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.92		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO011450.D	1	10/04/13	10/09/13	PB72659

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
Total PCBs	Total PCBs	155	U	34	155	310	ug/Kg
12674-11-2	Aroclor-1016	17	U	1.9	17	34	ug/Kg
11104-28-2	Aroclor-1221	17	U	5.6	17	34	ug/Kg
11141-16-5	Aroclor-1232	17	U	0.94	17	34	ug/Kg
53469-21-9	Aroclor-1242	17	U	4.5	17	34	ug/Kg
12672-29-6	Aroclor-1248	17	U	2	17	34	ug/Kg
11097-69-1	Aroclor-1254	17	U	2.3	17	34	ug/Kg
11096-82-5	Aroclor-1260	17	U	2.3	17	34	ug/Kg
37324-23-5	Aroclor-1262	17	U	10	17	34	ug/Kg
11100-14-4	Aroclor-1268	17	U	4.8	17	34	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	43.8		30 - 150		73%	SPK: 60
2051-24-3	Decachlorobiphenyl	110		30 - 150		92%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 Phone : 908 789 8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	Solid
Analytical Method:	NJEPH	% Moisture:	4.3
Sample Wt/Vol:	30.05 Units: g	Final Vol:	2000 uL
Soil Aliquot Vol:	uL	Test:	EPH

Prep Date :	Date Analyzed :	Prep Batch ID
10/04/13	10/08/13	PB72658

CAS Number	Parameter	Conc.	Qualifier	Dilution	MDL	LOD	LOQ / CRQL	Units	Datafile
TARGETS									
Aliphatic C9-C12	Aliphatic C9-C12	0.52	U	1	0.312	0.52	1.04	mg/kg	FC007508.D
Aliphatic C12-C16	Aliphatic C12-C16	0.348	U	1	0.253	0.348	0.695	mg/kg	FC007508.D
Aliphatic C16-C21	Aliphatic C16-C21	2.23		1	0.436	0.52	1.04	mg/kg	FC007508.D
Aliphatic C21-C28	Aliphatic C21-C28	1.11	J	1	0.557	0.695	1.39	mg/kg	FC007508.D
Aliphatic C28-C40	Aliphatic C28-C40	1.045	U	1	0.836	1.045	2.09	mg/kg	FC007508.D
Aromatic C10-C12	Aromatic C10-C12	0.348	U	1	0.151	0.348	0.695	mg/kg	FC007517.D
Aromatic C12-C16	Aromatic C12-C16	0.52	U	1	0.11	0.52	1.04	mg/kg	FC007517.D
Aromatic C16-C21	Aromatic C16-C21	0.547	J	1	0.158	0.87	1.74	mg/kg	FC007517.D
Aromatic C21-C36	Aromatic C21-C36	1.17	J	1	0.648	1.39	2.78	mg/kg	FC007517.D
Total AliphaticEPH	Total AliphaticEPH	3.34	J		2.39	3.13	6.26	mg/kg	
Total AromaticEPH	Total AromaticEPH	1.72	J		1.07	3.13	6.26	mg/kg	
Total EPH	Total EPH	5.06	J		3.46	6.25	12.5	mg/kg	

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 Phone: 908 789 8900 Fax : 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.			Date Collected:	10/03/13
Project:	ARC Horseshoe Road			Date Received:	10/03/13
Client Sample ID:	BF007(100313)			SDG No.:	E3984
Lab Sample ID:	E3984-01			Matrix:	Solid
Analytical Method:	NJEPH			% Moisture:	4.3
Sample Wt/Vol:	30.05	Units:	g	Final Vol:	2000 uL
Soil Aliquot Vol:			uL	Test:	EPH

File ID :	Dilution:	Prep Date :	Date Analyzed :	Prep Batch ID
FC007508.D	1	10/04/13	10/08/13	PB72658

CAS Number	Parameter		Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
Aliphatic C9-C12		Aliphatic C9-C12	0.52	U	0.312	0.52	1.04	mg/kg
Aliphatic C12-C16		Aliphatic C12-C16	0.348	U	0.253	0.348	0.695	mg/kg
Aliphatic C16-C21		Aliphatic C16-C21	2.23		0.436	0.52	1.04	mg/kg
Aliphatic C21-C28		Aliphatic C21-C28	1.11	J	0.557	0.695	1.39	mg/kg
Aliphatic C28-C40		Aliphatic C28-C40	1.045	U	0.836	1.045	2.09	mg/kg
SURROGATES								
1-chlorooctadecane (SURR)		1-chlorooctadecane (SURR)	24.1		40 - 140		48.2%	SPK: 50
ortho-Terphenyl (SURR)		ortho-Terphenyl (SURR)	0		40 - 140		0%	SPK: 50

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Quantitation Report For Aliphatic EPH Range.

Lab Sample ID:	E3984-01	Acq On:	08 Oct 2013 00:00
Client Sample ID:	BF007(100313)	Operator:	JJ
Data file:	FC007508.D	Misc:	
Instrument:	FID_C	ALS Vial:	13
Dilution Factor:	1	Sample Multiplier:	1.00

Compound	R.T.		Response	Conc	highest_standard	Units
Aliphatic C9-C12	2.97	6.10	167136	1.785	300	ug/ml
Aliphatic C12-C16	6.11	9.48	268834	2.886	200	ug/ml
Aliphatic C16-C21	9.49	12.82	3019299	32.111	300	ug/ml
Aliphatic C21-C28	12.83	16.49	1438839	15.95	400	ug/ml
Aliphatic C28-C40	16.50	21.17	664325	7.482	600	ug/ml
Aliphatic EPH	2.970	21.170	5558433	60.215		ug/ml
ortho-Terphenyl (SURR)	0.000	0.000	0	0		ug/ml
1-chlorooctadecane (SURR)	12.605	12.605	1914872	24.1		ug/ml
Aliphatic C9-C28	2.970	16.490	4894108	52.732	1200	ug/ml

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Report of Analysis

Client:	Creamer Environmental, Inc.			Date Collected:	10/03/13
Project:	ARC Horseshoe Road			Date Received:	10/03/13
Client Sample ID:	BF007(100313)			SDG No.:	E3984
Lab Sample ID:	E3984-01			Matrix:	Solid
Analytical Method:	NJEPH			% Moisture:	4.3
Sample Wt/Vol:	30.05	Units:	g	Final Vol:	2000 uL
Soil Aliquot Vol:			uL	Test:	EPH

File ID :	Dilution:	Prep Date :	Date Analyzed :	Prep Batch ID
FC007517.D	1	10/04/13	10/08/13	PB72658

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
Aromatic C10-C12	Aromatic C10-C12	0.348	U	0.151	0.348	0.695	mg/kg
Aromatic C12-C16	Aromatic C12-C16	0.52	U	0.11	0.52	1.04	mg/kg
Aromatic C16-C21	Aromatic C16-C21	0.547	J	0.158	0.87	1.74	mg/kg
Aromatic C21-C36	Aromatic C21-C36	1.17	J	0.648	1.39	2.78	mg/kg
SURROGATES							
2-Bromonaphthalene (SURR)	2-Bromonaphthalene (SURR)	50.5		40 - 140		101.08%	SPK: 50
4-Flurobiphenyl (SURR)	4-Flurobiphenyl (SURR)	51.9		40 - 140		103.86%	SPK: 50
ortho-Terphenyl (SURR)	ortho-Terphenyl (SURR)	27.9		40 - 140		55.88%	SPK: 50

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Quantitation Report For Aromatic EPH Range.

Lab Sample ID:	E3984-01	Acq On:	08 Oct 2013 5:59
Client Sample ID:	BF007(100313)	Operator:	JJ
Data file:	FC007517.D	Misc:	
Instrument:	FID_C	ALS Vial:	22
Dilution Factor:	1	Sample Multiplier:	1.00

Compound	R.T.		Response	Conc	highest_standard	Units
Aromatic C10-C12	4.0	5.70	175784	2.12	200	ug/ml
Aromatic C12-C16	5.71	8.30	124109	1.419	300	ug/ml
Aromatic C16-C21	8.31	12.54	687068	7.872	500	ug/ml
Aromatic C21-C36	12.55	18.00	1521649	16.86	800	ug/ml
Aromatic EPH	4.000	18.000	2508610	28.27		ug/ml
2-Bromonaphthalene (SURR)	7.265	7.265	3893962	50.54		ug/ml
4-Flurobiphenyl (SURR)	8.109	8.109	2711707	51.93		ug/ml
ortho-Terphenyl (SURR)	11.152	11.152	2519404	27.94		ug/ml

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	95.7

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	1120		1	1.3	7.45	14.9	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-36-0	Antimony	2.25	U	1	0.15	2.25	4.5	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-38-2	Arsenic	0.31	J	1	0.22	0.375	0.75	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-39-3	Barium	0.82	J	1	0.21	7.45	14.9	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-41-7	Beryllium	0.05	J	1	0.04	0.185	0.37	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-43-9	Cadmium	0.06	J	1	0.01	0.185	0.37	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-70-2	Calcium	32.1	J	1	0.97	186.5	373	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-47-3	Chromium	2		1	0.34	0.375	0.75	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-48-4	Cobalt	1.85	U	1	0.03	1.85	3.7	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-50-8	Copper	0.95	U	1	0.29	0.95	1.9	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7439-89-6	Iron	3760		1	0.6	3.75	7.5	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7439-92-1	Lead	0.88		1	0.05	0.375	0.75	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7439-95-4	Magnesium	5.9	J	1	2.6	186.5	373	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7439-96-5	Manganese	1.1		1	0.05	0.55	1.1	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7439-97-6	Mercury	0.05	U	1	0.009	0.05	0.1	mg/kg	10/04/13	10/04/13	ISM01.2_HG
7440-02-0	Nickel	0.72	J	1	0.04	1.5	3	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-09-7	Potassium	186.5	U	1	10.9	186.5	373	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7782-49-2	Selenium	1.3	U	1	0.26	1.3	2.6	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-22-4	Silver	0.37	J	1	0.03	0.375	0.75	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-23-5	Sodium	59.3	J	1	33	186.5	373	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-28-0	Thallium	0.95	U	1	0.17	0.95	1.9	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-62-2	Vanadium	3.3	J	1	0.29	1.85	3.7	mg/kg	10/04/13	10/04/13	EPA ISM01.2
7440-66-6	Zinc	4.4	J	1	0.44	2.25	4.5	mg/kg	10/04/13	10/04/13	EPA ISM01.2

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	BF007(100313)	SDG No.:	E3984
Lab Sample ID:	E3984-01	Matrix:	SOIL
		% Solid:	95.7

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.261	U	1	0.088	0.261	0.521	mg/Kg	10/04/13	10/04/13 19:10	ISM01.3_CN

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 10

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1310085
Client Name: CHEMTECH
ClientProject ID: ARC Horseshoe Road E3985

Field ID: BF007(100313)
Lab ID: 1310085-1

Sample Matrix: SOLID
Prep SOP: PAI 783 Rev 10
Date Collected: 03-Oct-13
Date Prepared: 08-Oct-13
Date Analyzed: 16-Oct-13

Prep Batch: RE131008-1
QCBatchID: RE131008-1-1
Run ID: RE131008-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.52 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.28 +/- 0.19	0.26	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1310085-1*

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E4502
QUOTE NO.
COC Number 031173

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Creamer Environmental
ADDRESS: 215 UNION ST.
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYERVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: G.Kowalski@creamerenvironmental
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: STANDARD DAYS *
HARD COPY: DAYS *
EDD: DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format:

ANALYSIS

1 VOC GCMS NJ clean
2 CYANIDE
3 Herbicide Gr 1
4 Merc + PCB
5 Metals NJ clean
6 PEST
7 SVOCMS
8 EPH CAT 1
9 Ra-226

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
1.	BF010(111413)	Soil		X	11/14	9:15		X	X	X	X	X	X	X	X	X	
2.	BF011 (111413)	Soil		X	11/14	0920		X	X	X	X	X	X	X	X	X	
3.	BF012 (111413)	Soil		X	11/14	0930		X	X	X	X	X	X	X	X	X	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

PRESERVATIVES — COMMENTS: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	11/14 930	1. [signature] 1630 11-14-13
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 1715 11-14-13	RECEIVED FOR LAB BY: 3. [signature]

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: No Hex or Tri Chrom
Cooler Temp. 5°
Ice in Cooler? yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT
Shipment Complete: ☐ YES ☐ NO

Revision 8/2007
WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following " Results Qualifiers" are used:

J Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).

U Indicates the analyte was analyzed for, but not detected.

ND Indicates the analyte was analyzed for, but not detected

E Indicates the reported value is estimated because of the presence of interference

M Indicates Duplicate injection precision not met.

N Indicates the spiked sample recovery is not within control limits.

S Indicates the reported value was determined by the Method of Standard Addition (MSA).

***** Indicates that the duplicate analysis is not within control limits.

+ Indicates the correlation coefficient for the MSA is less than 0.995.

D Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

M Method qualifiers
"P" for ICP instrument
"PM" for ICP when Microwave Digestion is used
"CV" for Manual Cold Vapor AA
"AV" for automated Cold Vapor AA
"CA" for MIDI-Distillation Spectrophotometric
"AS" for Semi –Automated Spectrophotometric
"C" for Manual Spectrophotometric
"T" for Titrimetric
"NR" for analyte not required to be analyzed

OR Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.

Q Indicates the LCS did not meet the control limits requirements

H Sample Analysis Out Of Hold Time

DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following " Results Qualifiers" are used:

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
ND	Indicates the analyte was analyzed for, but not detected
J	Indicates an estimated value. This flag is used: (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.) (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others.
B	Indicates the analyte was found in the blank as well as the sample report as "12 B".
E	Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P".
N	This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.
A	This flag indicates that a Tentatively Identified Compound is a suspected aldol-condensation product.
Q	Indicates the LCS did not meet the control limits requirements

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	6
Sample Wt/Vol:	4.64 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VT006878.D	1		11/15/13	VT111513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	2.85	U	1.8	2.85	5.7	ug/Kg
74-87-3	Chloromethane	2.85	U	0.69	2.85	5.7	ug/Kg
75-01-4	Vinyl chloride	2.85	U	1.2	2.85	5.7	ug/Kg
74-83-9	Bromomethane	2.85	U	1.3	2.85	5.7	ug/Kg
75-00-3	Chloroethane	2.85	U	0.91	2.85	5.7	ug/Kg
75-69-4	Trichlorofluoromethane	2.85	U	1.1	2.85	5.7	ug/Kg
75-35-4	1,1-Dichloroethene	2.85	U	1.1	2.85	5.7	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	2.85	U	0.85	2.85	5.7	ug/Kg
67-64-1	Acetone	6.8	J	3.1	5.5	11	ug/Kg
75-15-0	Carbon disulfide	2.85	U	0.58	2.85	5.7	ug/Kg
79-20-9	Methyl Acetate	2.85	U	0.77	2.85	5.7	ug/Kg
75-09-2	Methylene chloride	2.85	U	1.3	2.85	5.7	ug/Kg
156-60-5	trans-1,2-Dichloroethene	2.85	U	0.67	2.85	5.7	ug/Kg
1634-04-4	Methyl tert-butyl Ether	2.85	U	0.83	2.85	5.7	ug/Kg
75-34-3	1,1-Dichloroethane	2.85	U	0.79	2.85	5.7	ug/Kg
156-59-2	cis-1,2-Dichloroethene	2.85	U	0.64	2.85	5.7	ug/Kg
78-93-3	2-Butanone	5.5	U	2.2	5.5	11	ug/Kg
74-97-5	Bromochloromethane	2.85	U	0.78	2.85	5.7	ug/Kg
67-66-3	Chloroform	2.85	U	1.1	2.85	5.7	ug/Kg
71-55-6	1,1,1-Trichloroethane	2.85	U	0.72	2.85	5.7	ug/Kg
110-82-7	Cyclohexane	2.85	U	0.82	2.85	5.7	ug/Kg
56-23-5	Carbon tetrachloride	2.85	U	1.1	2.85	5.7	ug/Kg
71-43-2	Benzene	2.85	U	0.98	2.85	5.7	ug/Kg
107-06-2	1,2-Dichloroethane	2.85	U	0.91	2.85	5.7	ug/Kg
123-91-1	1,4-Dioxane	57	U	57	57	110	ug/Kg
79-01-6	Trichloroethene	2.85	U	1.3	2.85	5.7	ug/Kg
108-87-2	Methylcyclohexane	2.85	U	1	2.85	5.7	ug/Kg
78-87-5	1,2-Dichloropropane	2.85	U	1.3	2.85	5.7	ug/Kg
75-27-4	Bromodichloromethane	2.85	U	0.79	2.85	5.7	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	2.85	U	1	2.85	5.7	ug/Kg
108-10-1	4-Methyl-2-pentanone	5.5	U	2	5.5	11	ug/Kg

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	6
Sample Wt/Vol:	4.64 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VT006878.D	1		11/15/13	VT111513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-88-3	Toluene	2.85	U	0.66	2.85	5.7	ug/Kg
10061-02-6	trans-1,3-Dichloropropene	2.85	U	0.81	2.85	5.7	ug/Kg
79-00-5	1,1,2-Trichloroethane	2.85	U	1.3	2.85	5.7	ug/Kg
127-18-4	Tetrachloroethene	2.85	U	0.92	2.85	5.7	ug/Kg
591-78-6	2-Hexanone	5.5	U	2.9	5.5	11	ug/Kg
124-48-1	Dibromochloromethane	2.85	U	1.2	2.85	5.7	ug/Kg
106-93-4	1,2-Dibromoethane	2.85	U	0.78	2.85	5.7	ug/Kg
108-90-7	Chlorobenzene	2.85	U	0.97	2.85	5.7	ug/Kg
100-41-4	Ethylbenzene	2.85	U	1.1	2.85	5.7	ug/Kg
95-47-6	o-xylene	2.85	U	1.3	2.85	5.7	ug/Kg
179601-23-1	m&p-xylenes	2.85	U	0.7	2.85	5.7	ug/Kg
100-42-5	Styrene	2.85	U	0.91	2.85	5.7	ug/Kg
75-25-2	Bromoform	2.85	U	1.1	2.85	5.7	ug/Kg
98-82-8	Isopropylbenzene	2.85	U	0.69	2.85	5.7	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	2.85	U	0.75	2.85	5.7	ug/Kg
541-73-1	1,3-Dichlorobenzene	2.85	U	1.1	2.85	5.7	ug/Kg
106-46-7	1,4-Dichlorobenzene	2.85	U	0.86	2.85	5.7	ug/Kg
95-50-1	1,2-Dichlorobenzene	2.85	U	0.71	2.85	5.7	ug/Kg
96-12-8	1,2-Dibromo-3-chloropropane	2.85	U	2	2.85	5.7	ug/Kg
120-82-1	1,2,4-trichlorobenzene	2.85	U	1.8	2.85	5.7	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	2.85	U	2.1	2.85	5.7	ug/Kg
1330-20-7	Total Xylenes	5.5	U	2	5.5	11	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	43.4		68 - 122		87%	SPK: 50
19199-91-8	Chloroethane-d5	50.6		61 - 130		101%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	35.5		45 - 132		71%	SPK: 50
24313-50-6	2-Butanone-d5	86.2		20 - 182		86%	SPK: 100
865-49-6	Chloroform-d	51		72 - 123		102%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	48.1		79 - 122		96%	SPK: 50
1076-43-3	Benzene-d6	52.2		80 - 121		104%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	55		74 - 124		110%	SPK: 50
2037-26-5	Toluene-d8	53.7		78 - 121		107%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	6
Sample Wt/Vol:	4.64 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VT006878.D	1		11/15/13	VT111513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
93951-86-1	trans-1,3-Dichloropropene-d4	47.1		72 - 130		94%	SPK: 50
4840-82-8	2-Hexanone-d5	94		17 - 184		94%	SPK: 100
17647-74-4	1,4-Dioxane-d8	589		50 - 150		59%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	45.4		56 - 161		91%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	57.7		70 - 131		115%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	706545	11.22				
540-36-3	1,4-Difluorobenzene	810262	8.37				
3855-82-1	1,4-Dichlorobenzene-d4	337464	13.16				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	5.6
Sample Wt/Vol:	4.76 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group2
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF039605.D	1		11/15/13	VF111513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-65-0	Tert butyl alcohol	27.8	U	8.2	27.8	27.8	ug/Kg
107-02-8	Acrolein	27.8	U	4.4	27.8	27.8	ug/Kg
107-13-1	Acrylonitrile	2.8	U	2.8	2.8	27.8	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	42.7		56 - 120		85%	SPK: 50
1868-53-7	Dibromofluoromethane	46.1		57 - 135		92%	SPK: 50
2037-26-5	Toluene-d8	48.7		67 - 123		97%	SPK: 50
460-00-4	4-Bromofluorobenzene	45.5		33 - 141		91%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	428552	4.854				
540-36-3	1,4-Difluorobenzene	728481	5.582				
3114-55-4	Chlorobenzene-d5	527062	9.75				
3855-82-1	1,4-Dichlorobenzene-d4	201300	12.529				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	6
Sample Wt/Vol:	30.09 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 4.72

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083894.D	1	11/15/13	11/19/13	PB73469

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
100-52-7	Benzaldehyde	90	U	13	90	180	ug/Kg
108-95-2	Phenol	90	U	22	90	180	ug/Kg
111-44-4	Bis(2-chloroethyl)ether	90	U	21	90	180	ug/Kg
95-57-8	2-Chlorophenol	90	U	18	90	180	ug/Kg
95-48-7	2-Methylphenol	90	U	31	90	180	ug/Kg
108-60-1	2,2-Oxybis(1-chloropropane)	90	U	16	90	180	ug/Kg
98-86-2	Acetophenone	90	U	20	90	180	ug/Kg
65794-96-9	3+4-Methyphenols	90	U	23	90	180	ug/Kg
621-64-7	N-Nitroso-di-n-propylamine	90	U	23	90	180	ug/Kg
67-72-1	Hexachloroethane	90	U	21	90	180	ug/Kg
98-95-3	Nitrobenzene	90	U	19	90	180	ug/Kg
78-59-1	Isophorone	90	U	31	90	180	ug/Kg
105-67-9	2,4-Dimethylphenol	90	U	36	90	180	ug/Kg
111-91-1	Bis(2-chloroethoxy)methane	90	U	30	90	180	ug/Kg
120-83-2	2,4-Dichlorophenol	90	U	31	90	180	ug/Kg
91-20-3	Naphthalene	90	U	36	90	180	ug/Kg
87-68-3	Hexachlorobutadiene	90	U	36	90	180	ug/Kg
105-60-2	Caprolactam	90	U	21	90	180	ug/Kg
91-57-6	2-Methylnaphthalene	90	U	31	90	180	ug/Kg
77-47-4	Hexachlorocyclopentadiene	90	U	67	90	180	ug/Kg
88-06-2	2,4,6-Trichlorophenol	90	U	56	90	180	ug/Kg
95-95-4	2,4,5-Trichlorophenol	90	U	41	90	180	ug/Kg
92-52-4	1,1-Biphenyl	90	U	43	90	180	ug/Kg
91-58-7	2-Chloronaphthalene	90	U	35	90	180	ug/Kg
88-74-4	2-Nitroaniline	175	U	27	175	350	ug/Kg
131-11-3	Dimethylphthalate	320		51	90	180	ug/Kg
606-20-2	2,6-Dinitrotoluene	90	U	33	90	180	ug/Kg
208-96-8	Acenaphthylene	90	U	39	90	180	ug/Kg
83-32-9	Acenaphthene	90	U	45	90	180	ug/Kg
51-28-5	2,4-Dinitrophenol	175	U	67	175	350	ug/Kg
132-64-9	Dibenzofuran	90	U	46	90	180	ug/Kg

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	6
Sample Wt/Vol:	30.09 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 4.72

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083894.D	1	11/15/13	11/19/13	PB73469

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
121-14-2	2,4-Dinitrotoluene	90	U	36	90	180	ug/Kg
84-66-2	Diethylphthalate	90	J	55	90	180	ug/Kg
86-73-7	Fluorene	90	U	45	90	180	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	175	U	27	175	350	ug/Kg
86-30-6	N-Nitrosodiphenylamine	90	U	42	90	180	ug/Kg
118-74-1	Hexachlorobenzene	90	U	48	90	180	ug/Kg
1912-24-9	Atrazine	90	U	64	90	180	ug/Kg
87-86-5	Pentachlorophenol	175	U	74	175	350	ug/Kg
85-01-8	Phenanthrene	90	U	50	90	180	ug/Kg
120-12-7	Anthracene	90	U	49	90	180	ug/Kg
86-74-8	Carbazole	90	U	48	90	180	ug/Kg
84-74-2	Di-n-butylphthalate	90	U	46	90	180	ug/Kg
206-44-0	Fluoranthene	90	U	53	90	180	ug/Kg
129-00-0	Pyrene	90	U	54	90	180	ug/Kg
85-68-7	Butylbenzylphthalate	90	U	50	90	180	ug/Kg
91-94-1	3,3-Dichlorobenzidine	90	U	32	90	180	ug/Kg
56-55-3	Benzo(a)anthracene	90	U	54	90	180	ug/Kg
218-01-9	Chrysene	90	U	55	90	180	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	90	U	58	90	180	ug/Kg
117-84-0	Di-n-octylphthalate	90	U	60	90	180	ug/Kg
205-99-2	Benzo(b)fluoranthene	90	U	75	90	180	ug/Kg
207-08-9	Benzo(k)fluoranthene	90	U	62	90	180	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	90	U	54	90	180	ug/Kg
191-24-2	Benzo(g,h,i)perylene	90	U	56	90	180	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	90	U	21	90	180	ug/Kg
SURROGATES							
4165-62-2	Phenol-d5	20.9		17 - 103		52%	SPK: 40
93952-02-4	Bis(2-Chloroethyl)ether-d8	20.6		12 - 98		52%	SPK: 40
93951-73-6	2-Chlorophenol-d4	20.9		13 - 101		52%	SPK: 40
190780-66-6	4-Methylphenol-d8	21.2		8 - 100		53%	SPK: 40
4165-60-0	Nitrobenzene-d5	19.4		16 - 103		48%	SPK: 40
93951-78-1	2-Nitrophenol-d4	19.2		16 - 104		48%	SPK: 40

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	6
Sample Wt/Vol:	30.09 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 4.72

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083894.D	1	11/15/13	11/19/13	PB73469

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
93951-74-7	2,4-Dichlorophenol-d3	19		23 - 104		47%	SPK: 40
191656-33-4	4-Chloroaniline-d4	26.4		1 - 145		66%	SPK: 40
85448-30-2	Dimethylphthalate-d6	22.3		43 - 111		56%	SPK: 40
93951-97-4	Acenaphthylene-d8	21.2		20 - 97		53%	SPK: 40
93951-79-2	4-Nitrophenol-d4	17.5		16 - 166		44%	SPK: 40
81103-79-9	Fluorene-d10	22.2		40 - 108		55%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	8.92		1 - 121		22%	SPK: 40
1719-06-8	Anthracene-d10	21.6		22 - 98		54%	SPK: 40
1718-52-1	Pyrene-d10	22.6		51 - 120		57%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	21.7		43 - 111		54%	SPK: 40

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	130680	5.3
1146-65-2	Naphthalene-d8	606485	7.2
15067-26-2	Acenaphthene-d10	369196	9.99
1517-22-2	Phenanthrene-d10	692911	12.37
1719-03-5	Chrysene-d12	671141	16.63
1520-96-3	Perylene-d12	655602	18.75

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	5.6
Sample Wt/Vol:	30.04 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group2
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083965.D	1	11/15/13	11/20/13	PB73474

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	70.5	U	18.1	70.5	350	ug/Kg
103-33-3	Azobenzene	35.3	U	8.3	35.3	350	ug/Kg
92-87-5	Benzidine	70.5	U	35.4	70.5	350	ug/Kg
50-32-8	Benzo(a)pyrene	35.3	UQ	7.6	35.3	350	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	35.3	U	10.2	35.3	350	ug/Kg
SURROGATES							
4165-60-0	Nitrobenzene-d5	74.2		31 - 132		74%	SPK: 100
321-60-8	2-Fluorobiphenyl	78.2		39 - 123		78%	SPK: 100
1718-51-0	Terphenyl-d14	81.2		37 - 115		81%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	162802	5.3				
1146-65-2	Naphthalene-d8	715793	7.2				
15067-26-2	Acenaphthene-d10	428391	9.99				
1517-22-2	Phenanthrene-d10	851162	12.37				
1719-03-5	Chrysene-d12	830345	16.63				
1520-96-3	Perylene-d12	776494	18.75				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	5.6 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 4.72		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PD019967.D	1	11/15/13	11/18/13	PB73468

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.9	U	0.13	0.9	1.8	ug/Kg
319-85-7	beta-BHC	0.9	U	0.14	0.9	1.8	ug/Kg
58-89-9	gamma-BHC	0.9	U	0.12	0.9	1.8	ug/Kg
76-44-8	Heptachlor	0.9	U	0.13	0.9	1.8	ug/Kg
309-00-2	Aldrin	0.9	U	0.1	0.9	1.8	ug/Kg
1024-57-3	Heptachlor epoxide	0.9	U	0.12	0.9	1.8	ug/Kg
959-98-8	Endosulfan I	0.9	U	0.14	0.9	1.8	ug/Kg
60-57-1	Dieldrin	1.75	U	0.64	1.75	3.5	ug/Kg
72-55-9	4,4-DDE	1.75	U	0.098	1.75	3.5	ug/Kg
72-20-8	Endrin	1.75	U	0.095	1.75	3.5	ug/Kg
33213-65-9	Endosulfan II	1.75	U	0.089	1.75	3.5	ug/Kg
72-54-8	4,4-DDD	1.75	U	0.099	1.75	3.5	ug/Kg
1031-07-8	Endosulfan Sulfate	1.75	U	0.076	1.75	3.5	ug/Kg
50-29-3	4,4-DDT	1.75	U	0.09	1.75	3.5	ug/Kg
72-43-5	Methoxychlor	9	U	0.083	9	18	ug/Kg
53494-70-5	Endrin ketone	1.75	U	0.099	1.75	3.5	ug/Kg
7421-93-4	Endrin aldehyde	1.75	U	0.15	1.75	3.5	ug/Kg
5103-71-9	alpha-Chlordane	0.9	U	0.1	0.9	1.8	ug/Kg
5103-74-2	gamma-Chlordane	0.9	U	0.095	0.9	1.8	ug/Kg
8001-35-2	Toxaphene	90	U	35	90	180	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	50.4		30 - 150		84%	SPK: 60
2051-24-3	Decachlorobiphenyl	83.6		30 - 150		70%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	5.6 Decanted:
Sample Wt/Vol:	30.08 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.72		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO011977.D	1	11/15/13	11/15/13	PB73467

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	17.5	U	1.9	17.5	35	ug/Kg
11104-28-2	Aroclor-1221	17.5	U	5.7	17.5	35	ug/Kg
11141-16-5	Aroclor-1232	17.5	U	0.95	17.5	35	ug/Kg
53469-21-9	Aroclor-1242	17.5	U	4.5	17.5	35	ug/Kg
12672-29-6	Aroclor-1248	17.5	U	2	17.5	35	ug/Kg
11097-69-1	Aroclor-1254	17.5	U	2.3	17.5	35	ug/Kg
11096-82-5	Aroclor-1260	17.5	U	2.3	17.5	35	ug/Kg
37324-23-5	Aroclor-1262	17.5	U	10	17.5	35	ug/Kg
11100-14-4	Aroclor-1268	17.5	U	4.9	17.5	35	ug/Kg
Total PCBs	Total PCBs	160	U	35	160	320	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	44.7		30 - 150		75%	SPK: 60
2051-24-3	Decachlorobiphenyl	90.6		30 - 150		76%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	Solid
Analytical Method:	NJEPH	% Moisture:	5.6
Sample Wt/Vol:	30.05 Units: g	Final Vol:	2000 uL
Soil Aliquot Vol:	uL	Test:	EPH

Prep Date :	Date Analyzed :	Prep Batch ID
11/15/13	11/20/13	PB73470

CAS Number	Parameter	Conc.	Qualifier	Dilution	MDL	LOD	LOQ / CRQL	Units	Datafile
TARGETS									
Aliphatic C9-C12	Aliphatic C9-C12	0.53	U J	1	0.316	0.53	1.06	mg/kg	FC008271.D
Aliphatic C12-C16	Aliphatic C12-C16	0.353	U	1	0.256	0.353	0.705	mg/kg	FC008271.D
Aliphatic C16-C21	Aliphatic C16-C21	1.51		1	0.442	0.53	1.06	mg/kg	FC008271.D
Aliphatic C21-C28	Aliphatic C21-C28	0.705	U	1	0.565	0.705	1.41	mg/kg	FC008271.D
Aliphatic C28-C40	Aliphatic C28-C40	1.06	U	1	0.847	1.06	2.12	mg/kg	FC008271.D
Aromatic C10-C12	Aromatic C10-C12	0.353	U	1	0.153	0.353	0.705	mg/kg	FC008253.D
Aromatic C12-C16	Aromatic C12-C16	2.44		1	0.111	0.53	1.06	mg/kg	FC008253.D
Aromatic C16-C21	Aromatic C16-C21	3.16		1	0.161	0.88	1.76	mg/kg	FC008253.D
Aromatic C21-C36	Aromatic C21-C36	1.86	J	1	0.657	1.41	2.82	mg/kg	FC008253.D
Total AliphaticEPH	Total AliphaticEPH	3.18	U		2.43	3.18	6.36	mg/kg	
Total AromaticEPH	Total AromaticEPH	7.46			1.08	3.17	6.34	mg/kg	
Total EPH	Total EPH	8.97	J		3.51	6.35	12.7	mg/kg	

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MDL = Method Detection Limit
LOD = Limit of Detection
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	Solid
Analytical Method:	NJEPH	% Moisture:	5.6
Sample Wt/Vol:	30.05 Units: g	Final Vol:	2000 uL
Soil Aliquot Vol:	uL	Test:	EPH

File ID :	Dilution:	Prep Date :	Date Analyzed :	Prep Batch ID
FC008271.D	1	11/15/13	11/20/13	PB73470

CAS Number	Parameter		Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
Aliphatic C9-C12		Aliphatic C9-C12	0.53	U J	0.316	0.53	1.06	mg/kg
Aliphatic C12-C16		Aliphatic C12-C16	0.353	U	0.256	0.353	0.705	mg/kg
Aliphatic C16-C21		Aliphatic C16-C21	1.51		0.442	0.53	1.06	mg/kg
Aliphatic C21-C28		Aliphatic C21-C28	0.705	U	0.565	0.705	1.41	mg/kg
Aliphatic C28-C40		Aliphatic C28-C40	1.06	U	0.847	1.06	2.12	mg/kg
SURROGATES								
1-chlorooctadecane (SURR)		1-chlorooctadecane (SURR)	21.4		40 - 140		42.72%	SPK: 50
ortho-Terphenyl (SURR)		ortho-Terphenyl (SURR)	0		40 - 140		0%	SPK: 50

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Quantitation Report For Aliphatic EPH Range.

Lab Sample ID:	E4502-02	Acq On:	20 Nov 2013 4:25
Client Sample ID:	BF011(111413)	Operator:	JJ
Data file:	FC008271.D	Misc:	
Instrument:	FID_C	ALS Vial:	31
Dilution Factor:	1	Sample Multiplier:	1.00

Compound	R.T.		Response	Conc	highest_standard	Units
Aliphatic C9-C12	2.94	6.10	73285	0.922	300	ug/ml
Aliphatic C12-C16	6.11	9.45	56434	0.669	200	ug/ml
Aliphatic C16-C21	9.46	12.80	1888735	21.451	300	ug/ml
Aliphatic C21-C28	12.81	16.45	32122	0.366	400	ug/ml
Aliphatic C28-C40	16.46	21.15	277979	3.213	600	ug/ml
Aliphatic EPH	2.940	21.150	2328555	26.621		ug/ml
ortho-Terphenyl (SURR)	0.000	0.000	0	0		ug/ml
1-chlorooctadecane (SURR)	12.573	12.573	1872198	21.36		ug/ml
Aliphatic C9-C28	2.940	16.450	2050576	23.408	1200	ug/ml

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	Solid
Analytical Method:	NJEPH	% Moisture:	5.6
Sample Wt/Vol:	30.05 Units: g	Final Vol:	2000 uL
Soil Aliquot Vol:	uL	Test:	EPH

File ID :	Dilution:	Prep Date :	Date Analyzed :	Prep Batch ID
FC008253.D	1	11/15/13	11/19/13	PB73470

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
Aromatic C10-C12	Aromatic C10-C12	0.353	U	0.153	0.353	0.705	mg/kg
Aromatic C12-C16	Aromatic C12-C16	2.44		0.111	0.53	1.06	mg/kg
Aromatic C16-C21	Aromatic C16-C21	3.16		0.161	0.88	1.76	mg/kg
Aromatic C21-C36	Aromatic C21-C36	1.86	J	0.657	1.41	2.82	mg/kg
SURROGATES							
2-Bromonaphthalene (SURR)	2-Bromonaphthalene (SURR)	53.7		40 - 140		107.48%	SPK: 50
2-Flurobiphenyl (SURR)	2-Flurobiphenyl (SURR)	55.4		40 - 140		110.74%	SPK: 50
ortho-Terphenyl (SURR)	ortho-Terphenyl (SURR)	39.4		40 - 140		78.88%	SPK: 50

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Quantitation Report For Aromatic EPH Range.

Lab Sample ID:	E4502-02	Acq On:	19 Nov 2013 17:47
Client Sample ID:	BF011(111413)	Operator:	JJ
Data file:	FC008253.D	Misc:	
Instrument:	FID_C	ALS Vial:	13
Dilution Factor:	1	Sample Multiplier:	1.00

Compound	R.T.		Response	Conc	highest_standard	Units
Aromatic C10-C12	4.00	5.70	35537	0.456	200	ug/ml
Aromatic C12-C16	5.71	8.40	2764119	34.574	300	ug/ml
Aromatic C16-C21	8.41	12.55	3674969	44.764	500	ug/ml
Aromatic C21-C36	12.56	18.05	2329165	26.438	800	ug/ml
Aromatic EPH	4.000	18.050	8803790	106.233		ug/ml
2-Bromonaphthalene (SURR)	7.238	7.238	3701580	53.74		ug/ml
2-Flurobiphenyl (SURR)	8.084	8.084	2508269	55.37		ug/ml
ortho-Terphenyl (SURR)	11.125	11.125	3395056	39.44		ug/ml

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
Level (low/med):	low	% Solid:	94.4

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	1380		1	1.3	7.7	15.4	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-36-0	Antimony	2.3	U~~N~~	1	0.15	2.3	4.6	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-38-2	Arsenic	0.45	J~~N~~	1	0.22	0.385	0.77	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-39-3	Barium	15.4 ~~2.2~~	~~J~~ UB	1	0.21	7.7	15.4	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-41-7	Beryllium	0.38 ~~0.06~~	~~J~~ UB	1	0.04	0.19	0.38	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-43-9	Cadmium	0.02	J	1	0.01	0.19	0.38	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-70-2	Calcium	24.2	J	1	1	192	384	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-47-3	Chromium	2		1	0.35	0.385	0.77	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-48-4	Cobalt	1.9	U	1	0.03	1.9	3.8	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-50-8	Copper	0.95	U	1	0.3	0.95	1.9	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7439-89-6	Iron	3670		1	0.62	3.85	7.7	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7439-92-1	Lead	1.6		1	0.05	0.385	0.77	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7439-95-4	Magnesium	7.6	J	1	2.7	192	384	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7439-96-5	Manganese	1.9	~~N~~	1	0.05	0.6	1.2	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7439-97-6	Mercury	0.046	U	1	0.008	0.046	0.091	mg/kg	11/19/13	11/20/13	ISM01.2_HG
7440-02-0	Nickel	1.55	U	1	0.04	1.55	3.1	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-09-7	Potassium	192	U	1	11.2	192	384	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7782-49-2	Selenium	0.51	J~~N~~	1	0.27	1.35	2.7	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-22-4	Silver	0.385	U	1	0.03	0.385	0.77	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-23-5	Sodium	192	U	1	33.9	192	384	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-28-0	Thallium	0.95	U	1	0.18	0.95	1.9	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-62-2	Vanadium	2.9	J	1	0.3	1.9	3.8	mg/kg	11/15/13	11/15/13	EPA ISM01.2
7440-66-6	Zinc	2.9	J	1	0.45	2.3	4.6	mg/kg	11/15/13	11/15/13	EPA ISM01.2

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/14/13 09:20:00
Project:	ARC Horseshoe Road	Date Received:	11/14/13
Client Sample ID:	BF011(111413)	SDG No.:	E4502
Lab Sample ID:	E4502-02	Matrix:	SOIL
		% Solid:	94.4

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.265	U	1	0.089	0.265	0.529	mg/Kg	11/18/13	11/20/13 13:11	ISM01.3_CN

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 10

Sample Results

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1311360
Client Name: CHEMTECH
ClientProject ID: ARC Horseshoe Road E4503

Field ID: BF011(111413)
Lab ID: 1311360-2

Sample Matrix: SOLID
Prep SOP: PAI 783 Rev 10
Date Collected: 14-Nov-13
Date Prepared: 21-Nov-13
Date Analyzed: 26-Nov-13

Prep Batch: RE131121-1
QCBatchID: RE131121-1-1
Run ID: RE131121-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.51 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.18 +/- 0.18	0.25	1	U

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1311360-1*

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO.
QUOTE NO.
COC Number 028139

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Creamer Environmental
ADDRESS: 12 old Bridge RD
CITY: CEDAR GROVE STATE: NJ ZIP: 07009
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYERVILLE
PROJECT MANAGER: GARY Kowalski
e-mail: G.Kowalski@creamerenvironmental.c
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmentro#:
ADDRESS: 12 old Bridge RD
CITY CEDAR GROVE STATE: NJ ZIP: 07009
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 VOC GCMS NJ Clean
2 CYANIDE
3 Herbicide Gc1
4 Mercury + PCB
5 Metals - NJ Clean
6 Pesticide NJ Clean
7 SVOC MS NJ
8 EPH CAT 1
9 Ra-226

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
1.	BF013 (011714)	Soil		X	01/17	1000		X	X	X	X	X	X	X	X	X	
2.	TS 004 (011714)	Soil		X	01/17	9:15		X	X	X	X	X	X	X	X	X	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

PRESERVATIVES

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	1/17/14 1400	1. [signature]
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 1-17-14 1630	RECEIVED FOR LAB BY: 3. CW

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant Cooler Temp. 5°C
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: No Hex or Tri Chrom
Ice in Cooler?: ✓

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
F1175

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following " Results Qualifiers" are used:

J Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).

U Indicates the analyte was analyzed for, but not detected.

ND Indicates the analyte was analyzed for, but not detected

E Indicates the reported value is estimated because of the presence of interference

M Indicates Duplicate injection precision not met.

N Indicates the spiked sample recovery is not within control limits.

S Indicates the reported value was determined by the Method of Standard Addition (MSA).

***** Indicates that the duplicate analysis is not within control limits.

+ Indicates the correlation coefficient for the MSA is less than 0.995.

D Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.

M Method qualifiers
"P" for ICP instrument
"PM" for ICP when Microwave Digestion is used
"CV" for Manual Cold Vapor AA
"AV" for automated Cold Vapor AA
"CA" for MIDI-Distillation Spectrophotometric
"AS" for Semi –Automated Spectrophotometric
"C" for Manual Spectrophotometric
"T" for Titrimetric
"NR" for analyte not required to be analyzed

OR Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.

Q Indicates the LCS did not meet the control limits requirements

H Sample Analysis Out Of Hold Time

DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following " Results Qualifiers" are used:

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
ND	Indicates the analyte was analyzed for, but not detected
J	Indicates an estimated value. This flag is used: (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.) (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others.
B	Indicates the analyte was found in the blank as well as the sample report as "12 B".
E	Indicates the analyte 's concentration exceeds the calibrated range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P".
N	This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.
A	This flag indicates that a Tentatively Identified Compound is a suspected aldol-condensation product.
Q	Indicates the LCS did not meet the control limits requirements

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	8
Sample Wt/Vol:	4.43 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK049806.D	1		01/27/14	VK012714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	6	U	1.8	6	12	ug/Kg
74-87-3	Chloromethane	6	U	2.5	6	12	ug/Kg
75-01-4	Vinyl chloride	6	U	1.9	6	12	ug/Kg
74-83-9	Bromomethane	6	U	2.2	6	12	ug/Kg
75-00-3	Chloroethane	6	U	1.6	6	12	ug/Kg
75-69-4	Trichlorofluoromethane	6	U	1.4	6	12	ug/Kg
75-35-4	1,1-Dichloroethene	6	U	2.5	6	12	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	6	U	3	6	12	ug/Kg
67-64-1	Acetone	6.9	J	6.8	12.5	25	ug/Kg
75-15-0	Carbon disulfide	6	U	1.9	6	12	ug/Kg
79-20-9	Methyl Acetate	6	U	4.4	6	12	ug/Kg
75-09-2	Methylene chloride	12	~~JB~~ UB	2.4	6	12	ug/Kg
156-60-5	trans-1,2-Dichloroethene	6	U	2.5	6	12	ug/Kg
1634-04-4	Methyl tert-butyl Ether	6	U	2.3	6	12	ug/Kg
75-34-3	1,1-Dichloroethane	6	U	2.4	6	12	ug/Kg
156-59-2	cis-1,2-Dichloroethene	6	U	2.2	6	12	ug/Kg
78-93-3	2-Butanone	12.5	U	6.9	12.5	25	ug/Kg
74-97-5	Bromochloromethane	6	U	2.6	6	12	ug/Kg
67-66-3	Chloroform	6	U	2.9	6	12	ug/Kg
71-55-6	1,1,1-Trichloroethane	6	U	2.2	6	12	ug/Kg
110-82-7	Cyclohexane	6	U	2.3	6	12	ug/Kg
56-23-5	Carbon tetrachloride	6	U	2	6	12	ug/Kg
71-43-2	Benzene	6	U	2.4	6	12	ug/Kg
107-06-2	1,2-Dichloroethane	6	U	2.7	6	12	ug/Kg
123-91-1	1,4-Dioxane	125	U	70	125	250	ug/Kg
79-01-6	Trichloroethene	6	U	2.3	6	12	ug/Kg
108-87-2	Methylcyclohexane	6	U	2.1	6	12	ug/Kg
78-87-5	1,2-Dichloropropane	6	U	3.2	6	12	ug/Kg
75-27-4	Bromodichloromethane	6	U	2.4	6	12	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	6	U	3.2	6	12	ug/Kg
108-10-1	4-Methyl-2-pentanone	12.5	U	5.7	12.5	25	ug/Kg

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	8
Sample Wt/Vol:	4.43 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK049806.D	1		01/27/14	VK012714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-88-3	Toluene	6	U	2.2	6	12	ug/Kg
10061-02-6	trans-1,3-Dichloropropene	6	U	1.9	6	12	ug/Kg
79-00-5	1,1,2-Trichloroethane	6	U	2.7	6	12	ug/Kg
127-18-4	Tetrachloroethene	6	U	2.1	6	12	ug/Kg
591-78-6	2-Hexanone	12.5	U	4.2	12.5	25	ug/Kg
124-48-1	Dibromochloromethane	6	U	2.3	6	12	ug/Kg
106-93-4	1,2-Dibromoethane	6	U	1.8	6	12	ug/Kg
108-90-7	Chlorobenzene	6	U	2.3	6	12	ug/Kg
100-41-4	Ethylbenzene	6	U	2.2	6	12	ug/Kg
95-47-6	o-xylene	6	U	1.9	6	12	ug/Kg
179601-23-1	m&p-xylenes	6	U	1.9	6	12	ug/Kg
100-42-5	Styrene	6	U	1.9	6	12	ug/Kg
75-25-2	Bromoform	6	U	1.8	6	12	ug/Kg
98-82-8	Isopropylbenzene	6	U	2	6	12	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	6	U	1.8	6	12	ug/Kg
541-73-1	1,3-Dichlorobenzene	6	U	1.7	6	12	ug/Kg
106-46-7	1,4-Dichlorobenzene	6	U	2.1	6	12	ug/Kg
95-50-1	1,2-Dichlorobenzene	6	U	1.6	6	12	ug/Kg
96-12-8	1,2-Dibromo-3-chloropropane	6	U	1.5	6	12	ug/Kg
120-82-1	1,2,4-trichlorobenzene	6	U	2	6	12	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	6	U	1.6	6	12	ug/Kg
1330-20-7	Total Xylenes	12.5	U	4.3	12.5	25	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	27.6		68 - 122		110%	SPK: 25
19199-91-8	Chloroethane-d5	29.3		61 - 130		117%	SPK: 25
22280-73-5	1,1-Dichloroethene-d2	21.5		45 - 132		86%	SPK: 25
24313-50-6	2-Butanone-d5	45.3		20 - 182		91%	SPK: 50
865-49-6	Chloroform-d	27		72 - 123		108%	SPK: 25
17060-07-0	1,2-Dichloroethane-d4	26.4		79 - 122		106%	SPK: 25
1076-43-3	Benzene-d6	28		80 - 121		112%	SPK: 25
93952-08-0	1,2-Dichloropropane-d6	23.9		74 - 124		95%	SPK: 25
2037-26-5	Toluene-d8	27.2		78 - 121		109%	SPK: 25

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_VOC	% Moisture:	8
Sample Wt/Vol:	4.43 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK049806.D	1		01/27/14	VK012714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
93951-86-1	trans-1,3-Dichloropropene-d4	23.4		72 - 130		93%	SPK: 25
4840-82-8	2-Hexanone-d5	42.6		17 - 184		85%	SPK: 50
17647-74-4	1,4-Dioxane-d8	299		50 - 150		60%	SPK: 500
33685-54-0	1,1,2,2-Tetrachloroethane-d2	25.1		56 - 161		100%	SPK: 25
2199-69-1	1,2-Dichlorobenzene-d4	27.9		70 - 131		112%	SPK: 25
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	879328	10.66				
540-36-3	1,4-Difluorobenzene	1136630	7.6				
3855-82-1	1,4-Dichlorobenzene-d4	286697	12.6				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	8.5
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group2
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VD040565.D	1		01/30/14	VD013014

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-65-0	Tert butyl alcohol	27.3	U J	8.1	27.3	27.3	ug/Kg
107-02-8	Acrolein	27.3	U	4.3	27.3	27.3	ug/Kg
107-13-1	Acrylonitrile	2.7	U	2.7	2.7	27.3	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	55.3		56 - 120		111%	SPK: 50
1868-53-7	Dibromofluoromethane	56.7		57 - 135		113%	SPK: 50
2037-26-5	Toluene-d8	50.9		67 - 123		102%	SPK: 50
460-00-4	4-Bromofluorobenzene	50		33 - 141		100%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	4198850	6.481				
540-36-3	1,4-Difluorobenzene	5547650	7.597				
3114-55-4	Chlorobenzene-d5	6356220	11.782				
3855-82-1	1,4-Dichlorobenzene-d4	3797150	14.151				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	8
Sample Wt/Vol:	30.07 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : N/A

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG012311.D	1	01/21/14	01/23/14	PB74587

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
100-52-7	Benzaldehyde	185	U	26	185	370	ug/Kg
108-95-2	Phenol	185	U	46	185	370	ug/Kg
111-44-4	Bis(2-chloroethyl)ether	185	U	43	185	370	ug/Kg
95-57-8	2-Chlorophenol	185	U	37	185	370	ug/Kg
95-48-7	2-Methylphenol	185	U	63	185	370	ug/Kg
108-60-1	2,2-Oxybis(1-chloropropane)	185	U	33	185	370	ug/Kg
98-86-2	Acetophenone	185	U	41	185	370	ug/Kg
65794-96-9	3+4-Methylphenol	185	U	48	185	370	ug/Kg
621-64-7	N-Nitroso-di-n-propylamine	185	U	48	185	370	ug/Kg
67-72-1	Hexachloroethane	185	U	43	185	370	ug/Kg
98-95-3	Nitrobenzene	185	U	39	185	370	ug/Kg
78-59-1	Isophorone	185	U	63	185	370	ug/Kg
105-67-9	2,4-Dimethylphenol	185	U	74	185	370	ug/Kg
111-91-1	Bis(2-chloroethoxy)methane	185	U	61	185	370	ug/Kg
120-83-2	2,4-Dichlorophenol	185	U	63	185	370	ug/Kg
91-20-3	Naphthalene	185	U	74	185	370	ug/Kg
87-68-3	Hexachlorobutadiene	185	U	74	185	370	ug/Kg
105-60-2	Caprolactam	185	U	43	185	370	ug/Kg
91-57-6	2-Methylnaphthalene	185	U	63	185	370	ug/Kg
77-47-4	Hexachlorocyclopentadiene	185	U	140	185	370	ug/Kg
88-06-2	2,4,6-Trichlorophenol	185	U	110	185	370	ug/Kg
95-95-4	2,4,5-Trichlorophenol	185	U	85	185	370	ug/Kg
92-52-4	1,1-Biphenyl	185	U	89	185	370	ug/Kg
91-58-7	2-Chloronaphthalene	185	U	72	185	370	ug/Kg
88-74-4	2-Nitroaniline	360	U	54	360	720	ug/Kg
131-11-3	Dimethylphthalate	680		100	185	370	ug/Kg
606-20-2	2,6-Dinitrotoluene	185	U	67	185	370	ug/Kg
208-96-8	Acenaphthylene	185	U	80	185	370	ug/Kg
83-32-9	Acenaphthene	185	U	91	185	370	ug/Kg
51-28-5	2,4-Dinitrophenol	360	U	140	360	720	ug/Kg
132-64-9	Dibenzofuran	185	U	93	185	370	ug/Kg

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	8
Sample Wt/Vol:	30.07 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : N/A

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG012311.D	1	01/21/14	01/23/14	PB74587

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
121-14-2	2,4-Dinitrotoluene	185	U	74	185	370	ug/Kg
84-66-2	Diethylphthalate	185	U	110	185	370	ug/Kg
86-73-7	Fluorene	185	U	91	185	370	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	360	U	54	360	720	ug/Kg
86-30-6	N-Nitrosodiphenylamine	185	U	87	185	370	ug/Kg
118-74-1	Hexachlorobenzene	185	U	98	185	370	ug/Kg
1912-24-9	Atrazine	185	U	130	185	370	ug/Kg
87-86-5	Pentachlorophenol	360	U	150	360	720	ug/Kg
85-01-8	Phenanthrene	185	U	100	185	370	ug/Kg
120-12-7	Anthracene	185	U	100	185	370	ug/Kg
86-74-8	Carbazole	185	U	98	185	370	ug/Kg
84-74-2	Di-n-butylphthalate	185	U	93	185	370	ug/Kg
206-44-0	Fluoranthene	185	U	110	185	370	ug/Kg
129-00-0	Pyrene	185	U	110	185	370	ug/Kg
85-68-7	Butylbenzylphthalate	185	U	100	185	370	ug/Kg
91-94-1	3,3-Dichlorobenzidine	185	U	65	185	370	ug/Kg
56-55-3	Benzo(a)anthracene	185	U	110	185	370	ug/Kg
218-01-9	Chrysene	185	U	110	185	370	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	185	U	120	185	370	ug/Kg
117-84-0	Di-n-octylphthalate	185	U	120	185	370	ug/Kg
205-99-2	Benzo(b)fluoranthene	185	U	150	185	370	ug/Kg
207-08-9	Benzo(k)fluoranthene	185	U	130	185	370	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	185	U	110	185	370	ug/Kg
191-24-2	Benzo(g,h,i)perylene	185	U	110	185	370	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	185	U	43	185	370	ug/Kg
SURROGATES							
4165-62-2	Phenol-d5	23.6		17 - 103		59%	SPK: 40
93952-02-4	Bis(2-Chloroethyl)ether-d8	24.8		12 - 98		62%	SPK: 40
93951-73-6	2-Chlorophenol-d4	23.2		13 - 101		58%	SPK: 40
190780-66-6	4-Methylphenol-d8	24.3		8 - 100		61%	SPK: 40
4165-60-0	Nitrobenzene-d5	24.3		16 - 103		61%	SPK: 40
93951-78-1	2-Nitrophenol-d4	25.3		16 - 104		63%	SPK: 40

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	8
Sample Wt/Vol:	30.07 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : N/A

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG012311.D	1	01/21/14	01/23/14	PB74587

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
93951-74-7	2,4-Dichlorophenol-d3	23.3		23 - 104		58%	SPK: 40
191656-33-4	4-Chloroaniline-d4	26.4		1 - 145		66%	SPK: 40
85448-30-2	Dimethylphthalate-d6	26.5		43 - 111		66%	SPK: 40
93951-97-4	Acenaphthylene-d8	25.4		20 - 97		63%	SPK: 40
93951-79-2	4-Nitrophenol-d4	15.2		16 - 166		38%	SPK: 40
81103-79-9	Fluorene-d10	25.2		40 - 108		63%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	17.2		1 - 121		43%	SPK: 40
1719-06-8	Anthracene-d10	25.2		22 - 98		63%	SPK: 40
1718-52-1	Pyrene-d10	27		51 - 120		67%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	23.2		43 - 111		58%	SPK: 40

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	68111	7.03
1146-65-2	Naphthalene-d8	301678	9.15
15067-26-2	Acenaphthene-d10	180640	12.1
1517-22-2	Phenanthrene-d10	333047	14.57
1719-03-5	Chrysene-d12	303244	18.99
1520-96-3	Perylene-d12	274526	22.48

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	8.5
Sample Wt/Vol:	30.07 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group2
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF068221.D	1	01/21/14	01/22/14	PB74623

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	72.7	U	18.6	72.7	360	ug/Kg
103-33-3	Azobenzene	36.3	U	8.5	36.3	360	ug/Kg
92-87-5	Benzidine	72.7	U	36.5	72.7	360	ug/Kg
50-32-8	Benzo(a)pyrene	36.3	U	7.9	36.3	360	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	36.3	U	10.5	36.3	360	ug/Kg
SURROGATES							
4165-60-0	Nitrobenzene-d5	66.8		31 - 132		67%	SPK: 100
321-60-8	2-Fluorobiphenyl	71.1		39 - 123		71%	SPK: 100
1718-51-0	Terphenyl-d14	68.7		37 - 115		69%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	43103	6.55				
1146-65-2	Naphthalene-d8	189571	7.85				
15067-26-2	Acenaphthene-d10	103039	9.6				
1517-22-2	Phenanthrene-d10	183985	11.07				
1719-03-5	Chrysene-d12	205081	13.79				
1520-96-3	Perylene-d12	198368	15.5				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	8.5 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 4.21		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PD020587.D	1	01/20/14	01/21/14	PB74586

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.95	U	0.13	0.95	1.9	ug/Kg
319-85-7	beta-BHC	0.95	U	0.15	0.95	1.9	ug/Kg
58-89-9	gamma-BHC	0.95	U	0.12	0.95	1.9	ug/Kg
76-44-8	Heptachlor	0.95	U	0.14	0.95	1.9	ug/Kg
309-00-2	Aldrin	0.95	U	0.11	0.95	1.9	ug/Kg
1024-57-3	Heptachlor epoxide	0.95	U	0.12	0.95	1.9	ug/Kg
959-98-8	Endosulfan I	0.95	U	0.14	0.95	1.9	ug/Kg
60-57-1	Dieldrin	1.8	U	0.66	1.8	3.6	ug/Kg
72-55-9	4,4-DDE	1.8	U	0.1	1.8	3.6	ug/Kg
72-20-8	Endrin	1.8	U	0.098	1.8	3.6	ug/Kg
33213-65-9	Endosulfan II	1.8	U	0.092	1.8	3.6	ug/Kg
72-54-8	4,4-DDD	1.8	U	0.1	1.8	3.6	ug/Kg
1031-07-8	Endosulfan Sulfate	1.8	U	0.079	1.8	3.6	ug/Kg
50-29-3	4,4-DDT	1.8	U	0.093	1.8	3.6	ug/Kg
72-43-5	Methoxychlor	9.5	U	0.085	9.5	19	ug/Kg
53494-70-5	Endrin ketone	1.8	U	0.1	1.8	3.6	ug/Kg
7421-93-4	Endrin aldehyde	1.8	U	0.16	1.8	3.6	ug/Kg
5103-71-9	alpha-Chlordane	0.95	U	0.11	0.95	1.9	ug/Kg
5103-74-2	gamma-Chlordane	0.95	U	0.098	0.95	1.9	ug/Kg
8001-35-2	Toxaphene	95	U	36	95	190	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	46.6		30 - 150		78%	SPK: 60
2051-24-3	Decachlorobiphenyl	78.8		30 - 150		66%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	8.5 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.21		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO012498.D	1	01/20/14	01/22/14	PB74588

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
Total PCBs	Total PCBs	160	U	40	160	320	ug/Kg
12674-11-2	Aroclor-1016	18	U J	2	18	36	ug/Kg
11104-28-2	Aroclor-1221	18	U	5.9	18	36	ug/Kg
11141-16-5	Aroclor-1232	18	U	0.98	18	36	ug/Kg
53469-21-9	Aroclor-1242	18	U	4.7	18	36	ug/Kg
12672-29-6	Aroclor-1248	18	U	2.1	18	36	ug/Kg
11097-69-1	Aroclor-1254	18	U	2.4	18	36	ug/Kg
11096-82-5	Aroclor-1260	18	U	2.4	18	36	ug/Kg
37324-23-5	Aroclor-1262	18	U	11	18	36	ug/Kg
11100-14-4	Aroclor-1268	18	U	5	18	36	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	54.1		30 - 150		90%	SPK: 60
2051-24-3	Decachlorobiphenyl	89.7		30 - 150		75%	SPK: 120

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MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	Solid
Analytical Method:	NJEPH	% Moisture:	8.5
Sample Wt/Vol:	30.06 Units: g	Final Vol:	2000 uL
Soil Aliquot Vol:	uL	Test:	EPH

Prep Date :	Date Analyzed :	Prep Batch ID
01/17/14	01/23/14	PB74552

CAS Number	Parameter	Conc.	Qualifier	Dilution	MDL	LOD	LOQ / CRQL	Units	Datafile
TARGETS									
Aliphatic C9-C12	Aliphatic C9-C12	0.545	U J	1	0.326	0.545	1.09	mg/kg	FC009179.D
Aliphatic C12-C16	Aliphatic C12-C16	0.364	U	1	0.265	0.364	0.727	mg/kg	FC009179.D
Aliphatic C16-C21	Aliphatic C16-C21	0.545	U	1	0.455	0.545	1.09	mg/kg	FC009179.D
Aliphatic C21-C28	Aliphatic C21-C28	0.725	U	1	0.583	0.725	1.45	mg/kg	FC009179.D
Aliphatic C28-C40	Aliphatic C28-C40	0.941	J	1	0.874	1.09	2.18	mg/kg	FC009179.D
Aromatic C10-C12	Aromatic C10-C12	0.364	U	1	0.158	0.364	0.727	mg/kg	FC009197.D
Aromatic C12-C16	Aromatic C12-C16	3.44		1	0.115	0.545	1.09	mg/kg	FC009197.D
Aromatic C16-C21	Aromatic C16-C21	0.835	J	1	0.166	0.91	1.82	mg/kg	FC009197.D
Aromatic C21-C36	Aromatic C21-C36	0.754	J	1	0.678	1.455	2.91	mg/kg	FC009197.D
Total AliphaticEPH	Total AliphaticEPH	3.27	U		2.5	3.27	6.54	mg/kg	
Total AromaticEPH	Total AromaticEPH	5.03	J		1.12	3.275	6.55	mg/kg	
Total EPH	Total EPH	5.97	J		3.62	6.55	13.1	mg/kg	

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	Solid
Analytical Method:	NJEPH	% Moisture:	8.5
Sample Wt/Vol:	30.06 Units: g	Final Vol:	2000 uL
Soil Aliquot Vol:	uL	Test:	EPH

File ID :	Dilution:	Prep Date :	Date Analyzed :	Prep Batch ID
FC009179.D	1	01/17/14	01/23/14	PB74552

CAS Number	Parameter		Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
Aliphatic C9-C12		Aliphatic C9-C12	0.545	U J	0.326	0.545	1.09	mg/kg
Aliphatic C12-C16		Aliphatic C12-C16	0.364	U	0.265	0.364	0.727	mg/kg
Aliphatic C16-C21		Aliphatic C16-C21	0.545	U	0.455	0.545	1.09	mg/kg
Aliphatic C21-C28		Aliphatic C21-C28	0.725	U	0.583	0.725	1.45	mg/kg
Aliphatic C28-C40		Aliphatic C28-C40	0.941	J	0.874	1.09	2.18	mg/kg
SURROGATES								
1-chlorooctadecane (SURR)		1-chlorooctadecane (SURR)	19.7		40 - 140		39.34%	SPK: 50
ortho-Terphenyl (SURR)		ortho-Terphenyl (SURR)	0		40 - 140		0%	SPK: 50

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Quantitation Report For Aliphatic EPH Range.

Lab Sample ID:	F1175-01	Acq On:	23 Jan 2014 20:36
Client Sample ID:	BF013(011714)	Operator:	JJ
Data file:	FC009179.D	Misc:	
Instrument:	FID_C	ALS Vial:	8
Dilution Factor:	1	Sample Multiplier:	1.00

Compound	R.T.		Response	Conc	highest_standard	Units
Aliphatic C9-C12	3.34	6.55	36899	0.513	300	ug/ml
Aliphatic C12-C16	6.56	9.95	213210	2.95	200	ug/ml
Aliphatic C16-C21	9.96	13.35	200720	2.784	300	ug/ml
Aliphatic C21-C28	13.36	17.00	254344	3.548	400	ug/ml
Aliphatic C28-C40	17.01	22.00	941574	12.942	600	ug/ml
Aliphatic EPH	3.340	22.000	1646747	22.736		ug/ml
ortho-Terphenyl (SURR)	0.000	0.000	0	0		ug/ml
1-chlorooctadecane (SURR)	13.105	13.105	1423261	19.67		ug/ml
Aliphatic C9-C28	3.340	17.000	705173	9.795	1200	ug/ml

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Report of Analysis

Client:	Creamer Environmental, Inc.			Date Collected:	01/17/14
Project:	ARC Horseshoe Road			Date Received:	01/17/14
Client Sample ID:	BF013(011714)			SDG No.:	F1175
Lab Sample ID:	F1175-01			Matrix:	Solid
Analytical Method:	NJEPH			% Moisture:	8.5
Sample Wt/Vol:	30.06	Units:	g	Final Vol:	2000 uL
Soil Aliquot Vol:			uL	Test:	EPH

File ID :	Dilution:	Prep Date :	Date Analyzed :	Prep Batch ID
FC009197.D	1	01/17/14	01/24/14	PB74552

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
Aromatic C10-C12	Aromatic C10-C12	0.364	U	0.158	0.364	0.727	mg/kg
Aromatic C12-C16	Aromatic C12-C16	3.44		0.115	0.545	1.09	mg/kg
Aromatic C16-C21	Aromatic C16-C21	0.835	J	0.166	0.91	1.82	mg/kg
Aromatic C21-C36	Aromatic C21-C36	0.754	J	0.678	1.455	2.91	mg/kg
SURROGATES							
2-Bromonaphthalene (SURR)	2-Bromonaphthalene (SURR)	51.3		40 - 140		102.54%	SPK: 50
2-Flurobiphenyl (SURR)	2-Flurobiphenyl (SURR)	50.6		40 - 140		101.2%	SPK: 50
ortho-Terphenyl (SURR)	ortho-Terphenyl (SURR)	30.5		40 - 140		61.06%	SPK: 50

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Quantitation Report For Aromatic EPH Range.

Lab Sample ID:	F1175-01	Acq On:	24 Jan 2014 6:57
Client Sample ID:	BF013(011714)	Operator:	JJ
Data file:	FC009197.D	Misc:	
Instrument:	FID_C	ALS Vial:	26
Dilution Factor:	1	Sample Multiplier:	1.00

Compound	R.T.		Response	Conc	highest_standard	Units
Aromatic C10-C12	4.45	6.20	149469	2.026	200	ug/ml
Aromatic C12-C16	6.21	8.80	3747712	47.288	300	ug/ml
Aromatic C16-C21	8.81	13.15	936664	11.479	500	ug/ml
Aromatic C21-C36	13.16	18.65	907022	10.367	800	ug/ml
Aromatic EPH	4.450	18.650	5740867	71.16		ug/ml
2-Bromonaphthalene (SURR)	7.727	7.727	3514407	51.27		ug/ml
2-Flurobiphenyl (SURR)	8.599	8.599	2343178	50.6		ug/ml
ortho-Terphenyl (SURR)	11.662	11.662	2599906	30.53		ug/ml

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	91.5

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	1110		1	1.3	7.8	15.6	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-36-0	Antimony	0.24	J	1	0.16	2.35	4.7	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-38-2	Arsenic	0.66	J	1	0.23	0.39	0.78	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-39-3	Barium	1.2	J	1	0.22	7.8	15.6	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-41-7	Beryllium	0.195	U	1	0.04	0.195	0.39	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-43-9	Cadmium	0.195	U	1	0.01	0.195	0.39	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-70-2	Calcium	6.2	J	1	1	195	390	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-47-3	Chromium	2.1		1	0.35	0.39	0.78	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-48-4	Cobalt	1.95	U	1	0.03	1.95	3.9	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-50-8	Copper	0.49	J	1	0.3	1	2	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7439-89-6	Iron	3990		1	0.63	3.9	7.8	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7439-92-1	Lead	0.87		1	0.06	0.39	0.78	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7439-95-4	Magnesium	8.9	J	1	2.8	195	390	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7439-96-5	Manganese	1.5		1	0.05	0.6	1.2	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7439-97-6	Mercury	0.014	J	1	0.003	0.05	0.099	mg/kg	01/20/14	01/20/14	ISM01.3_HG
7440-02-0	Nickel	0.72	J	1	0.05	1.55	3.1	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-09-7	Potassium	195	U	1	11.4	195	390	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7782-49-2	Selenium	0.46	J~~N~~	1	0.27	1.35	2.7	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-22-4	Silver	0.1	J	1	0.03	0.39	0.78	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-23-5	Sodium	195	U	1	34.5	195	390	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-28-0	Thallium	1	U	1	0.18	1	2	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-62-2	Vanadium	2.4	J	1	0.3	1.95	3.9	mg/kg	01/20/14	01/23/14	EPA ISM01.3
7440-66-6	Zinc	4.3	J~~N~~	1	0.46	2.35	4.7	mg/kg	01/20/14	01/23/14	EPA ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/17/14 10:00:00
Project:	ARC Horseshoe Road	Date Received:	01/17/14
Client Sample ID:	BF013(011714)	SDG No.:	F1175
Lab Sample ID:	F1175-01	Matrix:	SOIL
		% Solid:	91.5

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.273	U	1	0.092	0.273	0.546	mg/Kg	01/23/14	01/23/14 15:36	ISM01.3_CN

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Ra-226 by Radon Emanation - Method 903.1

PAI 783 Rev 10

Sample Results

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1401246
Client Name: CHEMTECH
ClientProject ID: ARC Horseshoe Road F1176

Field ID: BF013(011714)
Lab ID: 1401246-1

Sample Matrix: SOLID
Prep SOP: PAI 783 Rev 10
Date Collected: 17-Jan-14
Date Prepared: 22-Jan-14
Date Analyzed: 30-Jan-14

Prep Batch: RE140122-1
QCBatchID: RE140122-1-1
Run ID: RE140122-1A
Count Time: 15 minutes
Report Basis: Dry Weight

Final Aliquot: 1.51 g
Prep Basis: Dry Weight
Moisture(%): NA
Result Units: pCi/g
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13982-63-3	Ra-226	0.35 +/- 0.18	0.13	1	LT

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

Data Package ID: *RE1401246-1*

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB and Metals Analyses

SDG#E2347

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #19796R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #E2347 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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				
					VOC	SVOC	PEST	PCB	MET
HRDD-41(0.5-1)	E2374-01	Soil	5/22/2013		X	X	X	X	X
HRDD-42(0.5-1)	E2374-02	Soil	5/22/2013		X	X	X	X	X
HRDD-43(0.5-1)	E2374-03	Soil	5/22/2013		X	X	X	X	X
HRDD-44(0.5-1)	E2374-04	Soil	5/22/2013		X	X	X	X	X
DUP(052213)	E2374-05	Soil	5/22/2013	HRDD-44(0.5-1)		X	X	X	X
FB(052213)	E2374-06	Water	5/22/2013		X	X	X	X	X

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods SOM01.2_VOC, SVOC, PEST, and PCB. Data were reviewed in accordance with the method specified criteria and USEPA National Functional Guidelines of June 2008.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 1.2	Water	14 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	14 days from collection to analysis	Cool to <6°C; preserved with sodium bisulfate

s.u. Standard units

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, trip, 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. Trip blanks measure contamination of samples during shipment. Rinse blanks measure contamination of samples during field operations.

QA Blank sample results associated with the compound methylene chloride that exhibited a non-detect sample result with sample locations within this SDG were not qualified.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 15 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and a RRF value greater than control limit (0.05). All compounds listed in Table 15 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 15 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and a RRF value greater than control limit (0.05). All target compounds associated with the closing continuing calibration standard must exhibit a percent difference (%D) less than the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
HRDD-44(0.5-1)	1,1-Dichloroethene-d2	>UL
	Benzene-d6 Toluene-d8	AC AC

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 21 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL) but > 20%	Non-detect	UJ
	Detect	J
< 20%	Non-detect	R
	Detect	J

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

All internal standard areas and retention times were within established limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this SDG.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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.

The field duplicate for VOC was not received by the laboratory and was not performed.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks		X		X	
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)					X
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
DMC Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					

%RSD	Relative standard deviation	%R	Percent recovery
RPD	Relative percent difference	%D	Percent difference

SEMI-VOLATILE VOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 1.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction 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.

No compounds were detected above the MDL in the associated blanks.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 28 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and an RRF value greater than control limit (0.05). All compounds listed in Table 28 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 28 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and RRF value greater than control limit (0.05). All target compounds not listed associated with the closing continuing calibration standard must exhibit a percent difference (%D) less then the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	Recovery
HRDD-41(0.5-1) HRDD-44(0.5-1)	Pyrene-d10	<LL but >10%
	Benzo(a)pyrene-d12	<LL but >10%
HRDD-42(0.5-1)	Pyrene-d10	<LL but >10%
	Benzo(a)pyrene-d12	AC

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 34 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL)	Non-detect	UJ or R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	No Action
	Detect	

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC to exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

All internal standard areas and retention times were within established limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compounds concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this SDG.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	All compounds	U	U	AC

AC Acceptable

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

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS) %R					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate(MSD) %R					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

PESTICIDES ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

The instrument performance checks are performed to ensure adequate resolution and instrument sensitivity.

3.1 Resolution Check Mixture

The resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 80% for all analytes on the primary column and greater than or equal to 50% for the confirmation column when one Individual Standard Mixture (C) is used. If two Individual Standard Mixtures (A and B) are used, the resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 60%.

3.2 Performance Evaluation Mixture (PEM)

The resolution between any two adjacent peaks in the Performance Evaluation Mixture (PEM) must be greater than or equal to 90% on each column. In addition, the percent breakdown of 4,4'-DDT and Endrin in the PEMs must each be less than or equal to 20% for each column and the combined percent breakdown must be less than or equal to 30% on each column.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The maximum RSD allowed is 20% for all target compounds with the exception of 25% for alpha-BHC and delta-BHC and 30% for toxaphene.

4.2 Continuing Calibration

All target compounds associated with the Performance Evaluation Mixture (PEM) must exhibit a percent difference (%D) less than the control limit (25%). All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) for the calibration factor less than the control limit (20%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. Pesticides analysis requires the two pesticides surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit a RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Florisil Cartridge Performance Check

The performance of each lot of Florisil cartridges used for sample cleanup must be checked at least once, or every six months. The performance check is acceptable if the recovery of the target pesticide compounds and surrogates in the Individual Standard Mixture (A) are 80 to 120% and the recovery limit for 2,4,5-trichlorophenol is less than 5%.

The performance check recoveries were within acceptable limits.

9. Gel Permeation Chromatography Performance Analysis

The GPC check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the recoveries of the pesticides in the GPC continuing calibration verification solution are within 80 to 110%.

The GPC calibration recoveries were within acceptable limits.

10. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	All compounds	U	U	AC

AC Acceptable

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

11. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must less than 25%.

The dual column analysis exhibited acceptable %D.

12. 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 VALIDATION CHECKLIST FOR PESTICIDES

SVOCs: SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate(LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)		X		X	
Matrix Spike Duplicate(MSD)		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Column %D $\leq$ 25%		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/confirmation		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% for each peak is allowed. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All peaks associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%). The closing continuing calibration standard must exhibit a %D less than the control limit (50%)

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires the surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
HRDD-41(0.5-1)	Aroclor 1260

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the method established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Gel Permeation Chromatography Performance Analysis

The GPC calibration check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the resolution of the phthalate and methoxychlor peaks in the GPC calibration mixture are greater than 85% and the perylene and sulfur peaks greater than 90% baseline resolution.

The GPC calibration resolution is acceptable.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	All compounds	U	U	AC

AC Acceptable

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

10. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must be less than 25%.

The dual column analysis exhibited acceptable %D.

11. 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 VALIDATION CHECKLIST FOR PCBs

PCBs; SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. 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 Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Column (%D)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

A post digestion spike (PS) was performed as required when matrix spike recoveries are outside control limits. The post spike results were evaluated as presented in the table below.

Sample Location	Analyte	MS Recovery	PS Recovery
HRDD-41(0.5-1)	Antimony	68%	87.8%
	Arsenic	1%	90.2%

The sample results will be qualified as presented in the following table. The qualifications are applied to all sample results associated with this SDG.

Control limit	Post Spike	Sample Result	Qualification
MS/MSD percent recovery <30%	PS percent recovery >75%	Non-detect	UJ
		Detect	J
	PS percent recovery <75%	Non-detect	R
		Detect	J

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory RPD
HRDD-41(0.5-1)	Arsenic	24%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to the all sample results associated with this SDG.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and laboratory sample concentration >5 times CRDL	<20%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result ≤ five times the RL and difference between samples >RL	Water one times RL or Soil two times RL	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	Antimony	28.3	30.2	6.5%
	Arsenic	697	932	28.9%

AC Acceptable

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

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within control limits, with the exception of the analytes presented in the following table. The sample locations associated with the deviant %D are also presented in the following table.

Sample Locations	Analytes	Serial Dilution (%D)
HRDD-41(0.5-1)	Arsenic	15%

The criteria used to evaluate the serial dilution are presented in the following table. In the case of a serial dilution deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

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 VALIDATION CHECKLIST FOR METAL

METALS/HG/CN; ILM05.4	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X	X		
ICP Serial Dilution		X	X		
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: July 24, 2013

PEER REVIEW: Dennis Capria

DATE: July 26, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2374
QUOTE NO.
COC Number 029499

CLIENT INFORMATION (REPORT TO BE SENT TO:)
COMPANY: Arcadis
ADDRESS: 105 Fieldcrest Ave suite 203
CITY: Edison STATE: NJ ZIP:
ATTENTION: JASON FLAGG
PHONE: 732-667-3800 FAX: 732-661-5067

CLIENT PROJECT INFORMATION
PROJECT NAME: ATLANTIC RESOURCES CORPORATION
PROJECT NO.: NJ514.7.1 LOCATION: SAYREVILLE, NJ
PROJECT MANAGER: MOH MOHIUDDIN
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION
BILL TO: PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION
FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION
☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☒ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 VOC (None)	2 Group 1 parameters (None)	3 Waste characterization (None)	4 Metals (HNO3)	5 VOCs (HCl)	6 SVOCs (None)	7 Pesticides (None)	8	9	COMMENTS
1.	HRDD-41(0.5-1)	S		X	5/22/13	1105	4	X	X								
2.	HRDD-42(0.5-1)	S		X	5/22/13	1115	4	X	X								
3.	HRDD-43(0.5-1)	S		X	5/22/13	1125	4	X	X								
4.	HRDD-44(0.5-1)	S		X	5/22/13	1135	4	X	X								
5.	DUP(052213)	S		X	5/22/13	—	4	X	X								
6.	WC-15	S	X		5/22/13	1145	4			X							
7.	FB(052213)	FB			5/22/13	1330	6				X	X	X	X			
8.																	
9.																	
10.																	

PRESERVATIVES: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	5-23-13 1305	1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 5-23-13 1445	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant Cooler Temp. 4°C
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Ice in Cooler?: ✓

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	32
Sample Wt/Vol:	5.67 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048758.D	1		05/24/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	6.5	U	1.3	3.25	6.5	ug/Kg
71-43-2	Benzene	6.5	U	1.3	3.25	6.5	ug/Kg
79-01-6	Trichloroethene	6.5	U	1.2	3.25	6.5	ug/Kg
108-88-3	Toluene	6.5	U	1.2	3.25	6.5	ug/Kg
127-18-4	Tetrachloroethene	6.5	U	1.1	3.25	6.5	ug/Kg
95-47-6	o-xylene	6.5	U	1	3.25	6.5	ug/Kg
179601-23-1	m&p-xylenes	6.5	U	1	3.25	6.5	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	54.4		68 - 122		109%	SPK: 50
19199-91-8	Chloroethane-d5	63.4		61 - 130		127%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	41.9		45 - 132		84%	SPK: 50
24313-50-6	2-Butanone-d5	86.9		20 - 182		87%	SPK: 100
865-49-6	Chloroform-d	55.5		72 - 123		111%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	60.4		79 - 122		121%	SPK: 50
1076-43-3	Benzene-d6	54.3		80 - 121		109%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	52.6		74 - 124		105%	SPK: 50
2037-26-5	Toluene-d8	53.1		78 - 121		106%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	43		72 - 130		86%	SPK: 50
4840-82-8	2-Hexanone-d5	59.4		17 - 184		59%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1240		50 - 150		124%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	72.9		56 - 161		146%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	65.5	*	70 - 131		131%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	436821	10.67				
540-36-3	1,4-Difluorobenzene	572306	7.6				
3855-82-1	1,4-Dichlorobenzene-d4	158380	12.61				

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	40
Sample Wt/Vol:	4.68 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048759.D	1		05/24/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	8.9	U	1.7	4.45	8.9	ug/Kg
71-43-2	Benzene	8.9	U	1.7	4.45	8.9	ug/Kg
79-01-6	Trichloroethene	8.9	U	1.7	4.45	8.9	ug/Kg
108-88-3	Toluene	8.9	U	1.6	4.45	8.9	ug/Kg
127-18-4	Tetrachloroethene	8.9	U	1.5	4.45	8.9	ug/Kg
95-47-6	o-xylene	8.9	U	1.4	4.45	8.9	ug/Kg
179601-23-1	m&p-xylenes	8.9	U	1.4	4.45	8.9	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	52.1		68 - 122		104%	SPK: 50
19199-91-8	Chloroethane-d5	61.6		61 - 130		123%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	40.1		45 - 132		80%	SPK: 50
24313-50-6	2-Butanone-d5	89.1		20 - 182		89%	SPK: 100
865-49-6	Chloroform-d	56.4		72 - 123		113%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	60.3		79 - 122		121%	SPK: 50
1076-43-3	Benzene-d6	58.3		80 - 121		117%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	57.7		74 - 124		115%	SPK: 50
2037-26-5	Toluene-d8	53.2		78 - 121		106%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	48		72 - 130		96%	SPK: 50
4840-82-8	2-Hexanone-d5	68.2		17 - 184		68%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1319		50 - 150		132%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	76.2		56 - 161		152%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	54.6		70 - 131		109%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	371438	10.67				
540-36-3	1,4-Difluorobenzene	542520	7.6				
3855-82-1	1,4-Dichlorobenzene-d4	129813	12.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	27
Sample Wt/Vol:	5.53 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048762.D	1		05/24/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	6.2	U	1.2	3.1	6.2	ug/Kg
71-43-2	Benzene	6.2	U	1.2	3.1	6.2	ug/Kg
79-01-6	Trichloroethene	6.2	U	1.2	3.1	6.2	ug/Kg
108-88-3	Toluene	6.2	U	1.1	3.1	6.2	ug/Kg
127-18-4	Tetrachloroethene	6.2	U	1	3.1	6.2	ug/Kg
95-47-6	o-xylene	6.2	U	0.96	3.1	6.2	ug/Kg
179601-23-1	m&p-xylenes	6.2	U	0.95	3.1	6.2	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	49.8		68 - 122		100%	SPK: 50
19199-91-8	Chloroethane-d5	55.7		61 - 130		111%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	38.4		45 - 132		77%	SPK: 50
24313-50-6	2-Butanone-d5	79		20 - 182		79%	SPK: 100
865-49-6	Chloroform-d	53.2		72 - 123		106%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	56.3		79 - 122		113%	SPK: 50
1076-43-3	Benzene-d6	51.4		80 - 121		103%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	50.3		74 - 124		101%	SPK: 50
2037-26-5	Toluene-d8	48.8		78 - 121		98%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	42.9		72 - 130		86%	SPK: 50
4840-82-8	2-Hexanone-d5	51.4		17 - 184		51%	SPK: 100
17647-74-4	1,4-Dioxane-d8	929		50 - 150		93%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	66		56 - 161		132%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	60.2		70 - 131		120%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	483604	10.67				
540-36-3	1,4-Difluorobenzene	646470	7.59				
3855-82-1	1,4-Dichlorobenzene-d4	152474	12.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	42
Sample Wt/Vol:	4.37 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048763.D	1		05/25/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	9.9	U	1.9	4.95	9.9	ug/Kg
71-43-2	Benzene	9.9	U	1.9	4.95	9.9	ug/Kg
79-01-6	Trichloroethene	9.9	U	1.9	4.95	9.9	ug/Kg
108-88-3	Toluene	9.9	U	1.8	4.95	9.9	ug/Kg
127-18-4	Tetrachloroethene	9.9	U	1.7	4.95	9.9	ug/Kg
95-47-6	o-xylene	9.9	U	1.5	4.95	9.9	ug/Kg
179601-23-1	m&p-xylenes	9.9	U	1.5	4.95	9.9	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	50.7		68 - 122		101%	SPK: 50
19199-91-8	Chloroethane-d5	58.4		61 - 130		117%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	39.8		45 - 132		80%	SPK: 50
24313-50-6	2-Butanone-d5	105		20 - 182		106%	SPK: 100
865-49-6	Chloroform-d	54.4		72 - 123		109%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	61.3	*	79 - 122		123%	SPK: 50
1076-43-3	Benzene-d6	48.6		80 - 121		97%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	49.1		74 - 124		98%	SPK: 50
2037-26-5	Toluene-d8	46.5		78 - 121		93%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	45.6		72 - 130		91%	SPK: 50
4840-82-8	2-Hexanone-d5	72.5		17 - 184		73%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1454		50 - 150		145%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	76.4		56 - 161		153%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	56.6		70 - 131		113%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	459496	10.67				
540-36-3	1,4-Difluorobenzene	568738	7.59				
3855-82-1	1,4-Dichlorobenzene-d4	145318	12.6				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_VOA	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH051834.D	1		05/24/13	VH052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	5	U	1.1	2.5	5	ug/L
71-43-2	Benzene	5	U	1.7	2.5	5	ug/L
79-01-6	Trichloroethene	5	U	2.1	2.5	5	ug/L
108-88-3	Toluene	5	U	1.7	2.5	5	ug/L
127-18-4	Tetrachloroethene	5	U	2.1	2.5	5	ug/L
95-47-6	o-xylene	5	U	1.6	2.5	5	ug/L
179601-23-1	m&p-xylenes	5	U	1.8	2.5	5	ug/L
SURROGATES							
6745-35-3	Vinyl Chloride-d3	52.9		65 - 131		106%	SPK: 50
19199-91-8	Chloroethane-d5	54.4		71 - 131		109%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	38.9		55 - 104		78%	SPK: 50
24313-50-6	2-Butanone-d5	109		49 - 155		109%	SPK: 100
865-49-6	Chloroform-d	50.9		78 - 121		102%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	54.5		78 - 129		109%	SPK: 50
1076-43-3	Benzene-d6	52.9		77 - 124		106%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	54.3		79 - 124		109%	SPK: 50
2037-26-5	Toluene-d8	51.9		77 - 121		104%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	44.9		73 - 121		90%	SPK: 50
4840-82-8	2-Hexanone-d5	111		28 - 135		111%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1555	*	50 - 150		156%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	47.2		73 - 125		94%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	49.4		80 - 131		99%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	515246	9.76				
540-36-3	1,4-Difluorobenzene	592752	5.62				
3855-82-1	1,4-Dichlorobenzene-d4	217005	12.51				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	32
Sample Wt/Vol:	30.06 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 5.97

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010070.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	250	U J	75	125	250	ug/Kg
218-01-9	Chrysene	250	U	76	125	250	ug/Kg
205-99-2	Benzo(b)fluoranthene	250	U	100	125	250	ug/Kg
207-08-9	Benzo(k)fluoranthene	250	U	85	125	250	ug/Kg
50-32-8	Benzo(a)pyrene	250	U	81	125	250	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	250	U	75	125	250	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	250	U	91	125	250	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	13.3		12 - 98		33%	SPK: 40
93951-73-6	2-Chlorophenol-d4	17.5		13 - 101		44%	SPK: 40
190780-66-6	4-Methylphenol-d8	10.6		8 - 100		26%	SPK: 40
4165-60-0	Nitrobenzene-d5	16.3		16 - 103		41%	SPK: 40
93951-78-1	2-Nitrophenol-d4	15.1		16 - 104		38%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	13.8		23 - 104		35%	SPK: 40
191656-33-4	4-Chloroaniline-d4	14.2		1 - 145		36%	SPK: 40
85448-30-2	Dimethylphthalate-d6	1.3	*	43 - 111		3%	SPK: 40
93951-97-4	Acenaphthylene-d8	15.3		20 - 97		38%	SPK: 40
93951-79-2	4-Nitrophenol-d4	10.9		16 - 166		27%	SPK: 40
81103-79-9	Fluorene-d10	14.5	*	40 - 108		36%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	4.32		1 - 121		11%	SPK: 40
1719-06-8	Anthracene-d10	14		22 - 98		35%	SPK: 40
1718-52-1	Pyrene-d10	13.3	*	51 - 120		33%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	10.1	*	43 - 111		25%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	164973	6.62				
1146-65-2	Naphthalene-d8	632560	8.75				
15067-26-2	Acenaphthene-d10	434221	11.69				
1517-22-2	Phenanthrene-d10	817462	14.14				
1719-03-5	Chrysene-d12	1019320	18.51				
1520-96-3	Perylene-d12	917139	21.61				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)			SDG No.:	E2374
Lab Sample ID:	E2374-01			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	32
Sample Wt/Vol:	30.06	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 5.97

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010070.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	40
Sample Wt/Vol:	30 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 6.97

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010071.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	280	U J	85	140	280	ug/Kg
218-01-9	Chrysene	280	U J	87	140	280	ug/Kg
205-99-2	Benzo(b)fluoranthene	280	U	120	140	280	ug/Kg
207-08-9	Benzo(k)fluoranthene	280	U	97	140	280	ug/Kg
50-32-8	Benzo(a)pyrene	280	U	92	140	280	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	280	U	85	140	280	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	280	U	100	140	280	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	14.5		12 - 98		36%	SPK: 40
93951-73-6	2-Chlorophenol-d4	18.2		13 - 101		45%	SPK: 40
190780-66-6	4-Methylphenol-d8	13.6		8 - 100		34%	SPK: 40
4165-60-0	Nitrobenzene-d5	18.2		16 - 103		46%	SPK: 40
93951-78-1	2-Nitrophenol-d4	18		16 - 104		45%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	16.4		23 - 104		41%	SPK: 40
191656-33-4	4-Chloroaniline-d4	18.4		1 - 145		46%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.38	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	18.4		20 - 97		46%	SPK: 40
93951-79-2	4-Nitrophenol-d4	12.6		16 - 166		32%	SPK: 40
81103-79-9	Fluorene-d10	17.8		40 - 108		44%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	3.51		1 - 121		9%	SPK: 40
1719-06-8	Anthracene-d10	19		22 - 98		47%	SPK: 40
1718-52-1	Pyrene-d10	19.8	*	51 - 120		49%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	18		43 - 111		45%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	168787	6.62				
1146-65-2	Naphthalene-d8	605758	8.74				
15067-26-2	Acenaphthene-d10	412105	11.69				
1517-22-2	Phenanthrene-d10	750269	14.14				
1719-03-5	Chrysene-d12	916536	18.51				
1520-96-3	Perylene-d12	838819	21.61				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)			SDG No.:	E2374
Lab Sample ID:	E2374-02			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	40
Sample Wt/Vol:	30	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 6.97

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010071.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	27
Sample Wt/Vol:	30.08 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 7.09

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010072.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	230	U	70	115	230	ug/Kg
218-01-9	Chrysene	230	U	71	115	230	ug/Kg
205-99-2	Benzo(b)fluoranthene	230	U	97	115	230	ug/Kg
207-08-9	Benzo(k)fluoranthene	230	U	79	115	230	ug/Kg
50-32-8	Benzo(a)pyrene	230	U	75	115	230	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	230	U	70	115	230	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	230	U	85	115	230	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	17.3		12 - 98		43%	SPK: 40
93951-73-6	2-Chlorophenol-d4	21.7		13 - 101		54%	SPK: 40
190780-66-6	4-Methylphenol-d8	18.4		8 - 100		46%	SPK: 40
4165-60-0	Nitrobenzene-d5	19.2		16 - 103		48%	SPK: 40
93951-78-1	2-Nitrophenol-d4	19.4		16 - 104		49%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	19.5		23 - 104		49%	SPK: 40
191656-33-4	4-Chloroaniline-d4	21.4		1 - 145		53%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.39	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	21.2		20 - 97		53%	SPK: 40
93951-79-2	4-Nitrophenol-d4	14.9		16 - 166		37%	SPK: 40
81103-79-9	Fluorene-d10	20.9		40 - 108		52%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	3.97		1 - 121		10%	SPK: 40
1719-06-8	Anthracene-d10	21.7		22 - 98		54%	SPK: 40
1718-52-1	Pyrene-d10	23.3		51 - 120		58%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	19.6		43 - 111		49%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	166239	6.62				
1146-65-2	Naphthalene-d8	636713	8.75				
15067-26-2	Acenaphthene-d10	432791	11.69				
1517-22-2	Phenanthrene-d10	816624	14.15				
1719-03-5	Chrysene-d12	958736	18.51				
1520-96-3	Perylene-d12	892577	21.61				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)			SDG No.:	E2374
Lab Sample ID:	E2374-03			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	27
Sample Wt/Vol:	30.08	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 7.09

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010072.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	42
Sample Wt/Vol:	30.05 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 7.10

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010073.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	290	U J	88	145	290	ug/Kg
218-01-9	Chrysene	290	U	90	145	290	ug/Kg
205-99-2	Benzo(b)fluoranthene	290	U	120	145	290	ug/Kg
207-08-9	Benzo(k)fluoranthene	290	U	100	145	290	ug/Kg
50-32-8	Benzo(a)pyrene	290	U	95	145	290	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	290	U	88	145	290	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	290	U	110	145	290	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	16.1		12 - 98		40%	SPK: 40
93951-73-6	2-Chlorophenol-d4	20.6		13 - 101		51%	SPK: 40
190780-66-6	4-Methylphenol-d8	14.9		8 - 100		37%	SPK: 40
4165-60-0	Nitrobenzene-d5	20.3		16 - 103		51%	SPK: 40
93951-78-1	2-Nitrophenol-d4	18.2		16 - 104		46%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	17.6		23 - 104		44%	SPK: 40
191656-33-4	4-Chloroaniline-d4	20		1 - 145		50%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.37	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	18.9		20 - 97		47%	SPK: 40
93951-79-2	4-Nitrophenol-d4	13.4		16 - 166		34%	SPK: 40
81103-79-9	Fluorene-d10	18.9		40 - 108		47%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	4.08		1 - 121		10%	SPK: 40
1719-06-8	Anthracene-d10	19.1		22 - 98		48%	SPK: 40
1718-52-1	Pyrene-d10	18.8	*	51 - 120		47%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	15.2	*	43 - 111		38%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	175498	6.62				
1146-65-2	Naphthalene-d8	638366	8.75				
15067-26-2	Acenaphthene-d10	444773	11.69				
1517-22-2	Phenanthrene-d10	820034	14.14				
1719-03-5	Chrysene-d12	989743	18.51				
1520-96-3	Perylene-d12	896746	21.61				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)			SDG No.:	E2374
Lab Sample ID:	E2374-04			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	42
Sample Wt/Vol:	30.05	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 7.10

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010073.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	41
Sample Wt/Vol:	30.04 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 6.96

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010074.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	290	U	86	145	290	ug/Kg
218-01-9	Chrysene	290	U	88	145	290	ug/Kg
205-99-2	Benzo(b)fluoranthene	290	U	120	145	290	ug/Kg
207-08-9	Benzo(k)fluoranthene	290	U	98	145	290	ug/Kg
50-32-8	Benzo(a)pyrene	290	U	93	145	290	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	290	U	86	145	290	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	290	U	100	145	290	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	16		12 - 98		40%	SPK: 40
93951-73-6	2-Chlorophenol-d4	21.1		13 - 101		53%	SPK: 40
190780-66-6	4-Methylphenol-d8	15.9		8 - 100		40%	SPK: 40
4165-60-0	Nitrobenzene-d5	19.7		16 - 103		49%	SPK: 40
93951-78-1	2-Nitrophenol-d4	20		16 - 104		50%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	18		23 - 104		45%	SPK: 40
191656-33-4	4-Chloroaniline-d4	20.3		1 - 145		51%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.37	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	20.7		20 - 97		52%	SPK: 40
93951-79-2	4-Nitrophenol-d4	15.3		16 - 166		38%	SPK: 40
81103-79-9	Fluorene-d10	20.2		40 - 108		51%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	4.21		1 - 121		11%	SPK: 40
1719-06-8	Anthracene-d10	20.8		22 - 98		52%	SPK: 40
1718-52-1	Pyrene-d10	21.8		51 - 120		54%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	18.2		43 - 111		46%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	167854	6.62				
1146-65-2	Naphthalene-d8	620555	8.75				
15067-26-2	Acenaphthene-d10	417461	11.69				
1517-22-2	Phenanthrene-d10	791123	14.14				
1719-03-5	Chrysene-d12	952584	18.5				
1520-96-3	Perylene-d12	885135	21.61				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	DUP(052213)			SDG No.:	E2374
Lab Sample ID:	E2374-05			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	41
Sample Wt/Vol:	30.04	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 6.96

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010074.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_BNA	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	CONH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 1.0	GPC Cleanup :	N PH : 5

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010063.D	1	05/28/13	05/28/13	PB70052

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	5	U	0.9	2.5	5	ug/L
218-01-9	Chrysene	5	U	1.1	2.5	5	ug/L
205-99-2	Benzo(b)fluoranthene	5	U	0.75	2.5	5	ug/L
207-08-9	Benzo(k)fluoranthene	5	U	1.7	2.5	5	ug/L
50-32-8	Benzo(a)pyrene	5	U	2.5	2.5	5	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	5	U	1.7	2.5	5	ug/L
53-70-3	Dibenzo(a,h)anthracene	5	U	0.52	2.5	5	ug/L
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	31.5		40 - 105		79%	SPK: 40
93951-73-6	2-Chlorophenol-d4	27.6		41 - 106		69%	SPK: 40
190780-66-6	4-Methylphenol-d8	19.6		25 - 111		49%	SPK: 40
4165-60-0	Nitrobenzene-d5	33		43 - 108		83%	SPK: 40
93951-78-1	2-Nitrophenol-d4	32.7		40 - 108		82%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	30.3		37 - 105		76%	SPK: 40
191656-33-4	4-Chloroaniline-d4	0.74		1 - 145		2%	SPK: 40
85448-30-2	Dimethylphthalate-d6	37.1		47 - 114		93%	SPK: 40
93951-97-4	Acenaphthylene-d8	34.9		41 - 107		87%	SPK: 40
93951-79-2	4-Nitrophenol-d4	7.11	*	33 - 116		18%	SPK: 40
81103-79-9	Fluorene-d10	35		42 - 111		88%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	31.1		22 - 104		78%	SPK: 40
1719-06-8	Anthracene-d10	35.6		44 - 110		89%	SPK: 40
1718-52-1	Pyrene-d10	36.8		52 - 119		92%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	34.2		32 - 121		86%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	193546	6.63				
1146-65-2	Naphthalene-d8	726670	8.75				
15067-26-2	Acenaphthene-d10	496047	11.69				
1517-22-2	Phenanthrene-d10	955656	14.15				
1719-03-5	Chrysene-d12	1178640	18.51				
1520-96-3	Perylene-d12	1068200	21.6				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_BNA	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	CONH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 1.0	GPC Cleanup :	N PH : 5

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010063.D	1	05/28/13	05/28/13	PB70052

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	32 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 5.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003747.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.5	U	0.14	1.25	2.5	ug/Kg
60-57-1	Dieldrin	4.8	U	0.89	2.4	4.8	ug/Kg
72-43-5	Methoxychlor	25	U	0.11	12.5	25	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	48		30 - 150		80%	SPK: 60
2051-24-3	Decachlorobiphenyl	92.8		30 - 150		77%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	39.7 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 6.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003748.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.8	U	0.16	1.4	2.8	ug/Kg
60-57-1	Dieldrin	5.5	U	1	2.75	5.5	ug/Kg
72-43-5	Methoxychlor	28	U	0.13	14	28	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	51.6		30 - 150		86%	SPK: 60
2051-24-3	Decachlorobiphenyl	100		30 - 150		84%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	27.4 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 7.09		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003749.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.3	U	0.13	1.15	2.3	ug/Kg
60-57-1	Dieldrin	4.5	U	0.83	2.25	4.5	ug/Kg
72-43-5	Methoxychlor	23	U	0.11	11.5	23	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	50		30 - 150		83%	SPK: 60
2051-24-3	Decachlorobiphenyl	97.6		30 - 150		81%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	41.7 Decanted:
Sample Wt/Vol:	30.03 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 7.10		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003750.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.9	U	0.17	1.45	2.9	ug/Kg
60-57-1	Dieldrin	5.7	U	1	2.85	5.7	ug/Kg
72-43-5	Methoxychlor	29	U	0.13	14.5	29	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	60.1		30 - 150		100%	SPK: 60
2051-24-3	Decachlorobiphenyl	111		30 - 150		93%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	41.2 Decanted:
Sample Wt/Vol:	30.08 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 6.96		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003751.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.9	U	0.16	1.45	2.9	ug/Kg
60-57-1	Dieldrin	5.6	U	1	2.8	5.6	ug/Kg
72-43-5	Methoxychlor	29	U	0.13	14.5	29	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	53.7		30 - 150		90%	SPK: 60
2051-24-3	Decachlorobiphenyl	102		30 - 150		85%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_Pest	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003744.D	1	05/28/13	05/29/13	PB70051

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	0.05	U	0.0024	0.025	0.05	ug/L
60-57-1	Dieldrin	0.1	U	0.0021	0.05	0.1	ug/L
72-43-5	Methoxychlor	0.5	U	0.0055	0.25	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	63.1		30 - 150		105%	SPK: 60
2051-24-3	Decachlorobiphenyl	105		30 - 150		88%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	32 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005654.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	48	U	2.6	24	48	ug/Kg
11104-28-2	Aroclor-1221	48	U	7.9	24	48	ug/Kg
11141-16-5	Aroclor-1232	48	U	1.3	24	48	ug/Kg
53469-21-9	Aroclor-1242	48	U	6.3	24	48	ug/Kg
12672-29-6	Aroclor-1248	48	U	2.8	24	48	ug/Kg
11097-69-1	Aroclor-1254	48	U	3.2	24	48	ug/Kg
11096-82-5	Aroclor-1260	48	U	3.2	24	48	ug/Kg
37324-23-5	Aroclor-1262	48	U	14	24	48	ug/Kg
11100-14-4	Aroclor-1268	48	U	6.8	24	48	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	45.2		30 - 150		75%	SPK: 60
2051-24-3	Decachlorobiphenyl	97.4		30 - 150		81%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	40 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 6.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005657.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	55	U	3	27.5	55	ug/Kg
11104-28-2	Aroclor-1221	55	U	9	27.5	55	ug/Kg
11141-16-5	Aroclor-1232	55	U	1.5	27.5	55	ug/Kg
53469-21-9	Aroclor-1242	55	U	7.2	27.5	55	ug/Kg
12672-29-6	Aroclor-1248	55	U	3.2	27.5	55	ug/Kg
11097-69-1	Aroclor-1254	55	U	3.7	27.5	55	ug/Kg
11096-82-5	Aroclor-1260	55	U	3.7	27.5	55	ug/Kg
37324-23-5	Aroclor-1262	55	U	16	27.5	55	ug/Kg
11100-14-4	Aroclor-1268	55	U	7.7	27.5	55	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	50.4		30 - 150		84%	SPK: 60
2051-24-3	Decachlorobiphenyl	90.9		30 - 150		76%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	27 Decanted:
Sample Wt/Vol:	30.08 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 7.09		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005658.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	45	U	2.5	22.5	45	ug/Kg
11104-28-2	Aroclor-1221	45	U	7.4	22.5	45	ug/Kg
11141-16-5	Aroclor-1232	45	U	1.2	22.5	45	ug/Kg
53469-21-9	Aroclor-1242	45	U	5.9	22.5	45	ug/Kg
12672-29-6	Aroclor-1248	45	U	2.6	22.5	45	ug/Kg
11097-69-1	Aroclor-1254	45	U	3	22.5	45	ug/Kg
11096-82-5	Aroclor-1260	45	U	3	22.5	45	ug/Kg
37324-23-5	Aroclor-1262	45	U	13	22.5	45	ug/Kg
11100-14-4	Aroclor-1268	45	U	6.3	22.5	45	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	48.3		30 - 150		81%	SPK: 60
2051-24-3	Decachlorobiphenyl	85.9		30 - 150		72%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	42 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 7.10		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005659.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	57	U	3.1	28.5	57	ug/Kg
11104-28-2	Aroclor-1221	57	U	9.3	28.5	57	ug/Kg
11141-16-5	Aroclor-1232	57	U	1.5	28.5	57	ug/Kg
53469-21-9	Aroclor-1242	57	U	7.4	28.5	57	ug/Kg
12672-29-6	Aroclor-1248	57	U	3.3	28.5	57	ug/Kg
11097-69-1	Aroclor-1254	57	U	3.8	28.5	57	ug/Kg
11096-82-5	Aroclor-1260	57	U	3.8	28.5	57	ug/Kg
37324-23-5	Aroclor-1262	57	U	17	28.5	57	ug/Kg
11100-14-4	Aroclor-1268	57	U	7.9	28.5	57	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	52.3		30 - 150		87%	SPK: 60
2051-24-3	Decachlorobiphenyl	94.9		30 - 150		79%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	41 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 6.96		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005660.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	56	U	3	28	56	ug/Kg
11104-28-2	Aroclor-1221	56	U	9.1	28	56	ug/Kg
11141-16-5	Aroclor-1232	56	U	1.5	28	56	ug/Kg
53469-21-9	Aroclor-1242	56	U	7.3	28	56	ug/Kg
12672-29-6	Aroclor-1248	56	U	3.2	28	56	ug/Kg
11097-69-1	Aroclor-1254	56	U	3.7	28	56	ug/Kg
11096-82-5	Aroclor-1260	56	U	3.7	28	56	ug/Kg
37324-23-5	Aroclor-1262	56	U	17	28	56	ug/Kg
11100-14-4	Aroclor-1268	56	U	7.8	28	56	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	48.6		30 - 150		81%	SPK: 60
2051-24-3	Decachlorobiphenyl	88.1		30 - 150		73%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	68

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	4	~~JN~~	1	0.22	3.35	6.7	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	24.4	J ~~*NE~~	1	0.32	0.55	1.1	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Level (low/med):	low	% Solid:	60.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	16.9	J ~~N~~	1	0.26	3.9	7.8	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	738	J ~~*NE~~	1	0.38	0.65	1.3	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Level (low/med):	low	% Solid:	72.6

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	7.3	J ~~N~~	1	0.2	2.95	5.9	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	549	J ~~*NE~~	1	0.29	0.495	0.99	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	58.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	28.3	J ~~N~~	1	0.28	4.15	8.3	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	697	J ~~*NE~~	1	0.4	0.7	1.4	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	58.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	30.2	J ~~N~~	1	0.26	3.9	7.8	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	932	J ~~*NE~~	1	0.38	0.65	1.3	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	60	U	1	2.4	30	60	ug/L	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	10	U	1	2.7	5	10	ug/L	05/28/13	05/28/13	ISM01.3

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

PCB Analysis

SDG#E2377

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20269R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # E2377 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB	PEST	MET
E2377	ARC-103(1-3)_05/23/13	E2377-01	Soil	05/23/2013				X		
	ARC-104(0-2)_05/23/13	E2377-02	Soil	05/23/2013				X		
	ARC-105(0-2)_05/23/13	E2377-03	Soil	05/23/2013				X		
	ARC-106(0-2)_05/23/13	E2377-04	Soil	05/23/2013				X		
	ARC-102(1-3)_05/23/13	E2377-05	Soil	05/23/2013				X		
	ARC-107(0-2)_05/23/13	E2377-06	Soil	05/23/2013				X		
	ARC-108(0-2)_05/23/13	E2377-07	Soil	05/23/2013				X		
	DUP(052313)_05/23/13	E2377-08	Soil	05/23/2013	ARC-107(0-2)_05/23/13			X		
	ARC-109(0-2)_05/23/13	E2377-09	Soil	05/23/2013				X		
	ARC-110(1-3)_05/23/13	E2377-10	Soil	05/23/2013				X		
	FB(052313)	E2377-11	Water	05/23/2013				X		

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8082A. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

POLYCHLORINATED BIPHENYLS (PCBs) 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 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% is allowed or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
ARC-103(1-3) ARC-104(0-2) ARC-105(0-2) ARC-106(0-2) ARC-107(0-2) ARC-108(0-2) ARC-109(0-2) ARC-110(1-3)	Tetrachloro-m-xylene	AC
	Decachlorobiphenyl	< LL but > 10%
ARC-105(0-2)	Tetrachloro-m-xylene	AC
	Decachlorobiphenyl	>UL

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
One surrogate exhibiting recovery outside the control limits but > 10%	Non-detect	No Action
	Detect	

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established

acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
ARC-103(1-3)	Aroclor 1016	AC	>UL

AC Acceptable

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J
Parent sample concentration > four times the MS/MSD spiking solution concentration (D).	Detect	No Action
	Non-detect	

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. 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 75% 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	Compound	Sample Result	Duplicate Result	RPD
ARC-107(0-2)/DUP(052313)	Aroclor 1254	79.9	64.6	21.2%

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

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (%RPD) of detected sample results must be less than 40%.

Sample DUP(052313) was qualified by the laboratory with a P, indicating column %RPD failure, however the %RPD was below 40%, therefore the P qualifier was removed.

10. 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 VALIDATION CHECKLIST FOR PCBs

PCBs; SW-846 8082	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. 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	
Surrogate Spike Recoveries		X	X		
Column (RPD) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: September 25, 2013

PEER REVIEW: Dennis Capria

DATE: September 30, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2377
QUOTE NO.
COC Number 029500

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Arcadis
ADDRESS: 105 Fieldcrest Ave, Suite 203
CITY: Edison STATE: NJ ZIP:
ATTENTION: Jason Flagg
PHONE: 732-661-3800 FAX: 732-661-5067

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Recovery Corporation
PROJECT NO.: NJ514.7 LOCATION: Sayreville
PROJECT MANAGER: Moh Mohuddin
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

PCB

PRESERVATIVES / **COMMENTS**

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

	CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
1.		ARC-103(1-3)	S		X	5/23/13	800	1										
2.		ARC-104(0-2)	S				820											
3.		ARC-105(0-2)	S				845											
4.		ARC-106(0-2)	S				905											
5.		ARC-102(1-3)	S				910											
6.		ARC-107(0-2)	S				920											
7.		ARC-108(0-2)	S				935											
8.		DUP(052313)	S				—											
9.		ARC-109(0-2)	S				1330											
10.		ARC 110(1-3)	S				1320											

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	10:15 5-24-13	1.
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3.	1210 5-24-13	3.

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°C
Ice in Cooler?: Yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☑ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2377
QUOTE NO.
COC Number 029501

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Arcadis
ADDRESS: 105 Fieldcrest Ave, Suite 20
CITY: Edison NJ STATE: ZIP:
ATTENTION: Jason Flagg
PHONE: 732-661-3809 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Recovery Corporation
PROJECT NO.: NJ5147 LOCATION: Sayreville
PROJECT MANAGER: Moh Mohuddin
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 PCB 2 3 4 5 6 7 8 9

PRESERVATIVES

1 None 2 3 4 5 6 7 8 9

COMMENTS

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
1.	FB(052313)	W		X	5/23/13	1340	1	X									
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	10:15 am 5.24.13	1. [signature]
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 1210 5.24.13	RECEIVED FOR LAB BY: 3. [signature]

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°C
Ice in Cooler?: Yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☑ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-103(1-3)	SDG No.:	E2377
Lab Sample ID:	E2377-01	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	11.5 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009207.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.2	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.2	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.2	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.2	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.2	ug/kg
11097-69-1	Aroclor-1254	3.8	U	1.7	3.8	19.2	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.2	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.5		10 - 166		83%	SPK: 20
2051-24-3	Decachlorobiphenyl	8.78	*	60 - 125		44%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-104(0-2)	SDG No.:	E2377
Lab Sample ID:	E2377-02	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	13.1 Decanted:
Sample Wt/Vol:	30.02 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009194.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.5	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.5	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.5	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.5	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.5	ug/kg
11097-69-1	Aroclor-1254	180		1.7	3.8	19.5	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.5	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	15.9		10 - 166		80%	SPK: 20
2051-24-3	Decachlorobiphenyl	9.41	*	60 - 125		47%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-104(0-2)RE	SDG No.:	E2377
Lab Sample ID:	E2377-02RE	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	13.1 Decanted:
Sample Wt/Vol:	30.02 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009210.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.5	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.5	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.5	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.5	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.5	ug/kg
11097-69-1	Aroclor-1254	190		1.7	3.8	19.5	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.5	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	19.1		10 - 166		95%	SPK: 20
2051-24-3	Decachlorobiphenyl	9.2	*	60 - 125		46%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-105(0-2)	SDG No.:	E2377
Lab Sample ID:	E2377-03	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	16 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009195.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	4	U	4	4	20.2	ug/kg
11104-28-2	Aroclor-1221	4	U	4	4	20.2	ug/kg
11141-16-5	Aroclor-1232	4	U	4	4	20.2	ug/kg
53469-21-9	Aroclor-1242	4	U	4	4	20.2	ug/kg
12672-29-6	Aroclor-1248	4	U	4	4	20.2	ug/kg
11097-69-1	Aroclor-1254	800	E	1.8	4	20.2	ug/kg
11096-82-5	Aroclor-1260	4	U	4	4	20.2	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	15.4		10 - 166		77%	SPK: 20
2051-24-3	Decachlorobiphenyl	279	*	60 - 125		1399%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-105(0-2)DL	SDG No.:	E2377
Lab Sample ID:	E2377-03DL	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	16 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009216.D	5	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	19.8	UD	19.8	19.8	100	ug/kg
11104-28-2	Aroclor-1221	19.8	UD	19.8	19.8	100	ug/kg
11141-16-5	Aroclor-1232	19.8	UD	19.8	19.8	100	ug/kg
53469-21-9	Aroclor-1242	19.8	UD	19.8	19.8	100	ug/kg
12672-29-6	Aroclor-1248	19.8	UD	19.8	19.8	100	ug/kg
11097-69-1	Aroclor-1254	950	~~D~~	8.9	19.8	100	ug/kg
11096-82-5	Aroclor-1260	19.8	~~UD~~	19.8	19.8	100	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.2		10 - 166		81%	SPK: 20
2051-24-3	Decachlorobiphenyl	292	*	60 - 125		1461%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-106(0-2)	SDG No.:	E2377
Lab Sample ID:	E2377-04	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	19.8 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009196.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	4.1	U	4.1	4.1	21.1	ug/kg
11104-28-2	Aroclor-1221	4.1	U	4.1	4.1	21.1	ug/kg
11141-16-5	Aroclor-1232	4.1	U	4.1	4.1	21.1	ug/kg
53469-21-9	Aroclor-1242	4.1	U	4.1	4.1	21.1	ug/kg
12672-29-6	Aroclor-1248	4.1	U	4.1	4.1	21.1	ug/kg
11097-69-1	Aroclor-1254	46.4		1.9	4.1	21.1	ug/kg
11096-82-5	Aroclor-1260	4.1	U	4.1	4.1	21.1	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	12.4		10 - 166		62%	SPK: 20
2051-24-3	Decachlorobiphenyl	10.3	*	60 - 125		52%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-106(0-2)RE	SDG No.:	E2377
Lab Sample ID:	E2377-04RE	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	19.8 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009211.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	4.1	U	4.1	4.1	21.1	ug/kg
11104-28-2	Aroclor-1221	4.1	U	4.1	4.1	21.1	ug/kg
11141-16-5	Aroclor-1232	4.1	U	4.1	4.1	21.1	ug/kg
53469-21-9	Aroclor-1242	4.1	U	4.1	4.1	21.1	ug/kg
12672-29-6	Aroclor-1248	4.1	U	4.1	4.1	21.1	ug/kg
11097-69-1	Aroclor-1254	79	P	1.9	4.1	21.1	ug/kg
11096-82-5	Aroclor-1260	4.1	U	4.1	4.1	21.1	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	13.6		10 - 166		68%	SPK: 20
2051-24-3	Decachlorobiphenyl	9.35	*	60 - 125		47%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-102(1-3)	SDG No.:	E2377
Lab Sample ID:	E2377-05	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	7 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009197.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.6	U	3.6	3.6	18.2	ug/kg
11104-28-2	Aroclor-1221	3.6	U	3.6	3.6	18.2	ug/kg
11141-16-5	Aroclor-1232	3.6	U	3.6	3.6	18.2	ug/kg
53469-21-9	Aroclor-1242	3.6	U	3.6	3.6	18.2	ug/kg
12672-29-6	Aroclor-1248	3.6	U	3.6	3.6	18.2	ug/kg
11097-69-1	Aroclor-1254	25.2		1.6	3.6	18.2	ug/kg
11096-82-5	Aroclor-1260	3.6	U	3.6	3.6	18.2	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.2		10 - 166		81%	SPK: 20
2051-24-3	Decachlorobiphenyl	13.5		60 - 125		68%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-107(0-2)	SDG No.:	E2377
Lab Sample ID:	E2377-06	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	15.3 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009198.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.9	U	3.9	3.9	20	ug/kg
11104-28-2	Aroclor-1221	3.9	U	3.9	3.9	20	ug/kg
11141-16-5	Aroclor-1232	3.9	U	3.9	3.9	20	ug/kg
53469-21-9	Aroclor-1242	3.9	U	3.9	3.9	20	ug/kg
12672-29-6	Aroclor-1248	3.9	U	3.9	3.9	20	ug/kg
11097-69-1	Aroclor-1254	79.9		1.8	3.9	20	ug/kg
11096-82-5	Aroclor-1260	3.9	U	3.9	3.9	20	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	11.6		10 - 166		58%	SPK: 20
2051-24-3	Decachlorobiphenyl	6.73	*	60 - 125		34%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-107(0-2)RE	SDG No.:	E2377
Lab Sample ID:	E2377-06RE	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	15.3 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009212.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.9	U	3.9	3.9	20	ug/kg
11104-28-2	Aroclor-1221	3.9	U	3.9	3.9	20	ug/kg
11141-16-5	Aroclor-1232	3.9	U	3.9	3.9	20	ug/kg
53469-21-9	Aroclor-1242	3.9	U	3.9	3.9	20	ug/kg
12672-29-6	Aroclor-1248	3.9	U	3.9	3.9	20	ug/kg
11097-69-1	Aroclor-1254	140	P	1.8	3.9	20	ug/kg
11096-82-5	Aroclor-1260	3.9	U	3.9	3.9	20	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	11.5		10 - 166		58%	SPK: 20
2051-24-3	Decachlorobiphenyl	7.02	*	60 - 125		35%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-108(0-2)	SDG No.:	E2377
Lab Sample ID:	E2377-07	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	12.8 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009199.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.5	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.5	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.5	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.5	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.5	ug/kg
11097-69-1	Aroclor-1254	260		1.7	3.8	19.5	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.5	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	13.3		10 - 166		67%	SPK: 20
2051-24-3	Decachlorobiphenyl	10.7	*	60 - 125		53%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-108(0-2)RE	SDG No.:	E2377
Lab Sample ID:	E2377-07RE	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	12.8 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009213.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.5	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.5	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.5	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.5	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.5	ug/kg
11097-69-1	Aroclor-1254	280		1.7	3.8	19.5	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.5	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	14.8		10 - 166		74%	SPK: 20
2051-24-3	Decachlorobiphenyl	8.99	*	60 - 125		45%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	DUP(052313)	SDG No.:	E2377
Lab Sample ID:	E2377-08	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	17.2 Decanted:
Sample Wt/Vol:	30.03 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009200.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	4	U	4	4	20.5	ug/kg
11104-28-2	Aroclor-1221	4	U	4	4	20.5	ug/kg
11141-16-5	Aroclor-1232	4	U	4	4	20.5	ug/kg
53469-21-9	Aroclor-1242	4	U	4	4	20.5	ug/kg
12672-29-6	Aroclor-1248	4	U	4	4	20.5	ug/kg
11097-69-1	Aroclor-1254	64.6	~~P~~	1.8	4	20.5	ug/kg
11096-82-5	Aroclor-1260	4	U	4	4	20.5	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	15.3		10 - 166		77%	SPK: 20
2051-24-3	Decachlorobiphenyl	12.6		60 - 125		63%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-109(0-2)	SDG No.:	E2377
Lab Sample ID:	E2377-09	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	12.3 Decanted:
Sample Wt/Vol:	30.09 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009201.D	1	05/28/13	06/01/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.3	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.3	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.3	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.3	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.3	ug/kg
11097-69-1	Aroclor-1254	120		1.7	3.8	19.3	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.3	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	15.6		10 - 166		78%	SPK: 20
2051-24-3	Decachlorobiphenyl	8.62	*	60 - 125		43%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-109(0-2)RE	SDG No.:	E2377
Lab Sample ID:	E2377-09RE	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	12.3 Decanted:
Sample Wt/Vol:	30.09 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009214.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.8	U	3.8	3.8	19.3	ug/kg
11104-28-2	Aroclor-1221	3.8	U	3.8	3.8	19.3	ug/kg
11141-16-5	Aroclor-1232	3.8	U	3.8	3.8	19.3	ug/kg
53469-21-9	Aroclor-1242	3.8	U	3.8	3.8	19.3	ug/kg
12672-29-6	Aroclor-1248	3.8	U	3.8	3.8	19.3	ug/kg
11097-69-1	Aroclor-1254	170		1.7	3.8	19.3	ug/kg
11096-82-5	Aroclor-1260	3.8	U	3.8	3.8	19.3	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	14.2		10 - 166		71%	SPK: 20
2051-24-3	Decachlorobiphenyl	10.3	*	60 - 125		52%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	ARC-110(1-3)	SDG No.:	E2377
Lab Sample ID:	E2377-10	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	14.2 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009215.D	1	05/28/13	06/03/13	PB70008

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	3.9	U	3.9	3.9	19.8	ug/kg
11104-28-2	Aroclor-1221	3.9	U	3.9	3.9	19.8	ug/kg
11141-16-5	Aroclor-1232	3.9	U	3.9	3.9	19.8	ug/kg
53469-21-9	Aroclor-1242	3.9	U	3.9	3.9	19.8	ug/kg
12672-29-6	Aroclor-1248	3.9	U	3.9	3.9	19.8	ug/kg
11097-69-1	Aroclor-1254	160		1.7	3.9	19.8	ug/kg
11096-82-5	Aroclor-1260	3.9	U	3.9	3.9	19.8	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.9		10 - 166		84%	SPK: 20
2051-24-3	Decachlorobiphenyl	11.3	*	60 - 125		56%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/23/13
Project:	ARC Sayreville PostEx	Date Received:	05/24/13
Client Sample ID:	FB(052313)	SDG No.:	E2377
Lab Sample ID:	E2377-11	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PC013765.D	1	05/24/13	05/28/13	PB70029

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.1	U	0.096	0.1	0.5	ug/L
11104-28-2	Aroclor-1221	0.1	U	0.1	0.1	0.5	ug/L
11141-16-5	Aroclor-1232	0.1	U	0.1	0.1	0.5	ug/L
53469-21-9	Aroclor-1242	0.1	U	0.089	0.1	0.5	ug/L
12672-29-6	Aroclor-1248	0.1	U	0.1	0.1	0.5	ug/L
11097-69-1	Aroclor-1254	0.1	U	0.044	0.1	0.5	ug/L
11096-82-5	Aroclor-1260	0.1	U	0.081	0.1	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	19.3		35 - 137		96%	SPK: 20
2051-24-3	Decachlorobiphenyl	14.2		40 - 135		71%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
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S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Metals Analyses

SDG#E2572

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20270R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # E2572 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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				
					VOC	SVOC	PCB	PEST	MET
HRDD-41(2-2.5)_06/14/13	E2572-01	Soil	06/14/2013						X
HRDD-41(3.5-4)_06/14/13	E2572-02	Soil	06/14/2013						X
HRDD-42(2-2.5)_06/14/13	E2572-03	Soil	06/14/2013						X
HRDD-42(3.5-4)_06/14/13	E2572-04	Soil	06/14/2013						X
HRDD-43(2-2.5)_06/14/13	E2572-05	Soil	06/14/2013						X
HRDD-43(3.5-4)_06/14/13	E2572-06	Soil	06/14/2013						X
HRDD-44(2-2.5)_06/14/13	E2572-07	Soil	06/14/2013						X
HRDD-44(3.5-4)_06/14/13	E2572-08	Soil	06/14/2013						X
DUP(061413)_06/14/13	E2572-09	Soil	06/14/2013	HRDD-41(2-2.5)_06/14/13					X
EB(061413)	E2572-10	Water	06/14/2013						X
FB(061413)	E2572-11	Water	06/14/2013						X

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	

QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery
HRDD-41(2-2.5)	Antimony	68%
	Arsenic	147%

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

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

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-41(2-2.5)/DUP(061413)	Antimony	1.1	1.2	8.7%
	Arsenic	9	13.8	42.1%

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

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within control limits.

8. System Performance and Overall Assessment

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
HRDD-43(3.5-4)	Arsenic	1660 E	1680 D	1680 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration within the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

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 VALIDATION CHECKLIST FOR METAL

METALS; ISM01.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution		X		X	
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: September 25, 2013

PEER REVIEW: Dennis Capria

DATE: September 30,2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2572
QUOTE NO.
COC Number 029321

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Arcadis
ADDRESS: 105 Fieldcrest Ave Suite 203
CITY: Edison STATE: NJ ZIP: 08837
ATTENTION: Moh Mohiddiens
PHONE: 732-661-3800 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Resources Corp
PROJECT NO.: NJ5514.7 LOCATION: Sayreville
PROJECT MANAGER: Moh Mohiddiens
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: Arcadis PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

	1	2	3	4	5	6	7	8	9
TCLP Metals	X								

PRESERVATIVES

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	TCLP Metals 1	2	3	4	5	6	7	8	9	COMMENTS
1.	HRDD-41 (2-2.5)	Soil		X	6/14/13	8:20	1	X									
2.	HRDD-41 (3.5-4)	Soil		X	6/14/13	8:25	1	X									
3.	HRDD-42 (2-2.5)	Soil		X	6/14/13	8:45	1	X									
4.	HRDD-42 (3.5-4)	Soil		X	6/14/13	8:50	1	X									
5.	HRDD-43 (2-2.5)	Soil		X	6/14/13	9:10	1	X									
6.	HRDD-43 (3.5-4)	Soil		X	6/14/13	9:15	1	X									
7.	HRDD-44 (2-2.5)	Soil		X	6/14/13	9:25	1	X									
8.	HRDD-44 (3.5-4)	Soil		X	6/14/13	9:30	1	X									
9.	DUP (061413)	Soil		X	6/14/13	—	1	X									
10, 11	EB (061413) / FB (061413)	AQ		X	6/14/13	9:50/10:50	1	X									

COMMENTS: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	6/14/13	1. [signature]
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. [signature]	1405 6-14-13	3. [signature]

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°
Ice in Cooler?: yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-41(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	73.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.1	JN	1	0.21	3.1	6.2	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	9	N J	1	0.3	0.5	1	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-42(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-03	Matrix:	SOIL
Level (low/med):	low	% Solid:	55.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	22.3	~~N~~ J	1	0.25	3.8	7.6	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	467	~~N~~ J	1	0.37	0.65	1.3	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-42(3.5-4)	SDG No.:	E2572
Lab Sample ID:	E2572-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	71.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	7.2	~~N~~ J	1	0.2	2.95	5.9	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	184	~~N~~ J	1	0.28	0.49	0.98	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-43(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	57.2

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	15.9	~~N~~ J	1	0.25	3.75	7.5	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	368	~~N~~ J	1	0.36	0.6	1.2	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-43(3.5-4)	SDG No.:	E2572
Lab Sample ID:	E2572-06	Matrix:	SOIL
Level (low/med):	low	% Solid:	57.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	29.3	~~N~~ J	1	0.25	3.8	7.6	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	1680 DJ ~~1660~~	~~ORN~~	1	0.37	0.635	1.27	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-43(3.5-4)DL	SDG No.:	E2572
Lab Sample ID:	E2572-06DL	Matrix:	SOIL
Level (low/med):	low	% Solid:	57.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	1680	ND	25	9.2	15.85	31.7	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-44(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-07	Matrix:	SOIL
Level (low/med):	low	% Solid:	55.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	19.2	~~N~~ J	1	0.27	4.05	8.1	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	402	~~N~~ J	1	0.39	0.7	1.4	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-44(3.5-4)	SDG No.:	E2572
Lab Sample ID:	E2572-08	Matrix:	SOIL
Level (low/med):	low	% Solid:	77.5

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.1	~~JN~~ J	1	0.19	2.8	5.6	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	21.8	~~N~~ J	1	0.27	0.47	0.94	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	DUP(061413)	SDG No.:	E2572
Lab Sample ID:	E2572-09	Matrix:	SOIL
Level (low/med):	low	% Solid:	72.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.2	~~JN~~	1	0.2	3.05	6.1	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	13.8	~~N~~ J	1	0.29	0.5	1	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	EB(061413)	SDG No.:	E2572
Lab Sample ID:	E2572-10	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	60	U	1	2.4	30	60	ug/L	06/18/13	06/19/13	ISM01.3
7440-38-2	Arsenic	10	U	1	2.7	5	10	ug/L	06/18/13	06/19/13	ISM01.3

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	FB(061413)	SDG No.:	E2572
Lab Sample ID:	E2572-11	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	60	U	1	2.4	30	60	ug/L	06/18/13	06/19/13	ISM01.3
7440-38-2	Arsenic	10	U	1	2.7	5	10	ug/L	06/18/13	06/19/13	ISM01.3

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB and Metals Analyses

SDG#E2733

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20271R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) #E2733 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB	PEST	MET
E2733	ARC-115(4-8)_06/27/13	E2733-01	Soil	06/27/2013				X		
	ARC-117(4-8)_06/27/13	E2733-02	Soil	06/27/2013				X		
	PWC-60(12-16)_06/27/13	E2733-03	Soil	06/27/2013		X				
	HRDD-42(5.5-6.0)_06/27/13	E2733-04	Soil	06/27/2013						X
	HRDD-43(5.5-6.0)_06/27/13	E2733-05	Soil	06/27/2013						X
	HRDD-44(5.5-6.0)_06/27/13	E2733-06	Soil	06/27/2013						X

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods SOM01.2_VOC and PCB. Data were reviewed in accordance with the method specified criteria and USEPA National Functional Guidelines of June 2008.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2	Water	14 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	14 days from collection to analysis	Cool to <6°C; preserved with sodium bisulfate

s.u. Standard units

The results for sample PWC-60(12-16) were reported in wet weight due to insufficient sample to complete a percent solids analysis. All results will be qualified as estimated. All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, trip, 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. Trip blanks measure contamination of samples during shipment. Rinse blanks measure contamination of samples during field operations.

All compounds associated with the QA blanks exhibited a concentration less than the MDL.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 15 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and a RRF value greater than control limit (0.05). All compounds listed in Table 15 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 15 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and a RRF value greater than control limit (0.05). All target compounds associated with the closing continuing calibration standard must exhibit a percent difference (%D) less than the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
PWC-60(12-16)	Vinyl Chloride-d3	> UL
	Chloroethane-d5	> UL
	1,1-Dichloroethene-d2	AC
	2-Butanone-d5	AC
	Chloroform-d	> UL
	1,2-Dichloroethane-d4	AC
	Benzene-d6	> UL
	1,2-Dichloropropane-d6	> UL
	Toluene-d8	> UL
	trans-1,3-Dichloropropene-d4	> UL
	2-Hexanone-d5	AC
	1,4-Dioxane-d8	AC
	1,1,2,2-Tetrachloroethane-d2	AC
	1,2-Dichlorobenzene-d4	AC
PWC-60(12-16)DL	Vinyl Chloride-d3	> UL
	Chloroethane-d5	> UL
	1,1-Dichloroethene-d2	AC
	2-Butanone-d5	> UL
	Chloroform-d	> UL
	1,2-Dichloroethane-d4	> UL
	Benzene-d6	> UL
	1,2-Dichloropropane-d6	> UL
	Toluene-d8	> UL
	trans-1,3-Dichloropropene-d4	> UL
	2-Hexanone-d5	AC
	1,4-Dioxane-d8	AC
	1,1,2,2-Tetrachloroethane-d2	> UL
	1,2-Dichlorobenzene-d4	> UL

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 21 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL) but > 20%	Non-detect	UJ
	Detect	J
< 20%	Non-detect	R
	Detect	J

Sample PWC-60(12-16) was reanalyzed at a dilution due to target compounds above the calibration range. All non-detect results from the primary analysis will be replaced by the results from the diluted analysis, while detected results from the primary analysis will be reported.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
PWC-60(12-16)	Chlorobenzene-d5	<50%
	1,4-Difluorobenzene	<50%
	1,4-Dichlorobenzene-d4	<50%
PWC-60(12-16)DL	Chlorobenzene-d5	AC
	1,4-Difluorobenzene	AC
	1,4-Dichlorobenzene-d4	AC

Acceptable (AC)

The criteria used to evaluate the internal standard responses are presented in the following table. In the case of an internal standard deviation, the compounds quantitated under the deviant internal standard are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 200%	Non-detect	No action
	Detect	J
< 50%	Non-detect	R
	Detect	J

Sample PWC-60(12-16) was reanalyzed at a dilution due to target compounds above the calibration range. The diluted analysis exhibited internal standards within limits. All non-detect results from the primary analysis will be reported from the diluted analysis, while detected results from the primary analysis will be reported.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not performed on a sample within this data set.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
PWC-60(12-16)	Trichloroethene	7200 E	670 D	670 D
	cis-1,2-Dichloroethene	77	64 DJ	64 DJ
	Chlorobenzene	250 E	240 U	250 EJ

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration within the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Storage blanks		X		X	
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)					X
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)		X		X	
DMC Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X	X		
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					

%RSD Relative standard deviation %R Percent recovery
RPD Relative percent difference %D Percent difference

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% for each peak is allowed. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All peaks associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%). The closing continuing calibration standard must exhibit a %D less than the control limit (50%)

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires the surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD recoveries exceeded acceptance limit, however the concentration of the non-spiked aroclor in the sample exceeded the MS/MSD by greater than a factor of four. The data was not qualified.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the method established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Gel Permeation Chromatography Performance Analysis

The GPC calibration check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the resolution of the phthalate and methoxychlor peaks in the GPC calibration mixture are greater than 85% and the perylene and sulfur peaks greater than 90% baseline resolution.

The GPC calibration resolution is acceptable.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

10. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must be less than 25%.

The dual column analysis exhibited acceptable %D.

All sample results associated with aroclors that exhibited a concentration greater than the linear range of the instrument calibration were reported from the analysis in which the aroclor is within calibration range.

11. 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 VALIDATION CHECKLIST FOR PCBs

PCBs; SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. 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 Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Column (%D)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery
HRDD-42(5.5-6.0)	Antimony	50%

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

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

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within 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 VALIDATION CHECKLIST FOR METAL

METALS/HG/CN; ILM05.4	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution		X		X	
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: September 26, 2013

PEER REVIEW: Dennis Capria

DATE: October 3, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH

CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2733
QUOTE NO.
COC Number 029653

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: ARCADIS
ADDRESS: 105 Fieldcrest Ave, Suite 203
CITY: Edison STATE: NJ ZIP: 08837
ATTENTION: Moh Mohiuddin
PHONE: 732-661-3800 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Resources Corporation
PROJECT NO.: NJ 574.7 LOCATION: Sayreville
PROJECT MANAGER: Moh Mohiuddin
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: ARCADIS PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: Standard DAYS *
HARD COPY: Standard DAYS *
EDD: Standard DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☒ LEVEL 4: Results + QC (all raw data)
☐ EDD Format:

ANALYSIS

PCB's
Total VOC,
TCL Metals

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	~~ARC-114 (4-8)~~	~~Soil~~	~~X~~		~~6/27/13~~			~~X~~									
2. 1	ARC-115 (4-8)	Soil	X		6/27/13	9:30	3	X									
3.	~~ARC-116 (4-8)~~	~~Soil~~	~~X~~		~~6/27/13~~			~~X~~									
4. 2	ARC-117 (4-8)	Soil	X		6/27/13	830	3	X									
5.	~~ARC-118 (4-8)~~	~~Soil~~	~~X~~		~~6/27/13~~			~~X~~									
6. 3	PWC-60 (12-14)	Soil	X		6/27/13	11:30	3		X								
7. 4	HRDD-42 (5.5-6.0)	Soil	X		6/27/13	10:45	1	1		X							Hold
8. 5	HRDD-43 (5.5-6.0)	Soil	X		6/27/13	11:00	1	1		X							Hold
9. 6	HRDD-44 (5.5-6.0)	Soil	X		6/27/13	11:10	1			X							Hold
10.																	

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	6/27/13 1515	1. [signature]
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. [signature]	6-27-13 1750	3. [signature]

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°
Ice in Cooler?: Yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

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Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	PWC-60(12-16)	SDG No.:	E2733
Lab Sample ID:	E2733-03	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	0
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048788.D	1		07/01/13	VK070113

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	5	U	0.75	2.5	5	ug/Kg
74-87-3	Chloromethane	5	U	1	2.5	5	ug/Kg
75-01-4	Vinyl chloride	5	U	0.77	2.5	5	ug/Kg
74-83-9	Bromomethane	5	U	0.91	2.5	5	ug/Kg
75-00-3	Chloroethane	5	U	0.66	2.5	5	ug/Kg
75-69-4	Trichlorofluoromethane	5	U	0.59	2.5	5	ug/Kg
75-35-4	1,1-Dichloroethene	5	U	1	2.5	5	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	5	U	1.2	2.5	5	ug/Kg
67-64-1	Acetone	13		2.8	5	10	ug/Kg
75-15-0	Carbon disulfide	5	U	0.77	2.5	5	ug/Kg
79-20-9	Methyl Acetate	5	U	1.8	2.5	5	ug/Kg
75-09-2	Methylene chloride	2.5	J	0.97	2.5	5	ug/Kg
156-60-5	trans-1,2-Dichloroethene	2	J	1	2.5	5	ug/Kg
1634-04-4	Methyl tert-butyl Ether	5	U	0.93	2.5	5	ug/Kg
75-34-3	1,1-Dichloroethane	30		0.97	2.5	5	ug/Kg
156-59-2	cis-1,2-Dichloroethene	77		0.88	2.5	5	ug/Kg
78-93-3	2-Butanone	10	U	2.8	5	10	ug/Kg
74-97-5	Bromochloromethane	5	U	1.1	2.5	5	ug/Kg
67-66-3	Chloroform	5	U	1.2	2.5	5	ug/Kg
71-55-6	1,1,1-Trichloroethane	20		0.92	2.5	5	ug/Kg
110-82-7	Cyclohexane	5	U	0.94	2.5	5	ug/Kg
56-23-5	Carbon tetrachloride	5	U	0.82	2.5	5	ug/Kg
71-43-2	Benzene	59		0.96	2.5	5	ug/Kg
107-06-2	1,2-Dichloroethane	5	U	1.1	2.5	5	ug/Kg
123-91-1	1,4-Dioxane	100	U	29	50	100	ug/Kg
79-01-6	Trichloroethene	7200	E	0.94	2.5	5	ug/Kg
108-87-2	Methylcyclohexane	5	U	0.85	2.5	5	ug/Kg
78-87-5	1,2-Dichloropropane	5	U	1.3	2.5	5	ug/Kg
75-27-4	Bromodichloromethane	5	U	0.96	2.5	5	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	5	U	1.3	2.5	5	ug/Kg
108-10-1	4-Methyl-2-pentanone	10	U	2.3	5	10	ug/Kg

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	PWC-60(12-16)	SDG No.:	E2733
Lab Sample ID:	E2733-03	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	0
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048788.D	1		07/01/13	VK070113

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-88-3	Toluene	8		0.91	2.5	5	ug/Kg
10061-02-6	trans-1,3-Dichloropropene	5	U	0.79	2.5	5	ug/Kg
79-00-5	1,1,2-Trichloroethane	3.7	J	1.1	2.5	5	ug/Kg
127-18-4	Tetrachloroethene	5	U	0.84	2.5	5	ug/Kg
591-78-6	2-Hexanone	10	U	1.7	5	10	ug/Kg
124-48-1	Dibromochloromethane	5	U	0.95	2.5	5	ug/Kg
106-93-4	1,2-Dibromoethane	5	U	0.75	2.5	5	ug/Kg
108-90-7	Chlorobenzene	250	E	0.95	2.5	5	ug/Kg
100-41-4	Ethylbenzene	5	U	0.88	2.5	5	ug/Kg
95-47-6	o-xylene	5	U	0.78	2.5	5	ug/Kg
179601-23-1	m&p-xylenes	5	U	0.77	2.5	5	ug/Kg
100-42-5	Styrene	5	U	0.77	2.5	5	ug/Kg
75-25-2	Bromoform	5	U	0.74	2.5	5	ug/Kg
98-82-8	Isopropylbenzene	5	U	0.82	2.5	5	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	5	U	0.73	2.5	5	ug/Kg
541-73-1	1,3-Dichlorobenzene	5	U	0.68	2.5	5	ug/Kg
106-46-7	1,4-Dichlorobenzene	5	U	0.83	2.5	5	ug/Kg
95-50-1	1,2-Dichlorobenzene	5	U	0.66	2.5	5	ug/Kg
96-12-8	1,2-Dibromo-3-chloropropane	5	U	0.61	2.5	5	ug/Kg
120-82-1	1,2,4-trichlorobenzene	5	U	0.82	2.5	5	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	5	U	0.67	2.5	5	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	83.4	*	68 - 122		167%	SPK: 50
19199-91-8	Chloroethane-d5	78.4	*	61 - 130		157%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	49.2		45 - 132		98%	SPK: 50
24313-50-6	2-Butanone-d5	103		20 - 182		103%	SPK: 100
865-49-6	Chloroform-d	62.7	*	72 - 123		125%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	60.2		79 - 122		120%	SPK: 50
1076-43-3	Benzene-d6	131	*	80 - 121		264%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	126	*	74 - 124		253%	SPK: 50
2037-26-5	Toluene-d8	86.1	*	78 - 121		172%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	74.5	*	72 - 130		149%	SPK: 50

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	PWC-60(12-16)	SDG No.:	E2733
Lab Sample ID:	E2733-03	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	0
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048788.D	1		07/01/13	VK070113

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
4840-82-8	2-Hexanone-d5	92.4		17 - 184		92%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1318		50 - 150		132%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	49.2		56 - 161		98%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	46.4		70 - 131		93%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	82659	10.66				
540-36-3	1,4-Difluorobenzene	232311	7.59				
3855-82-1	1,4-Dichlorobenzene-d4	10561	12.59				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	PWC-60(12-16)DL	SDG No.:	E2733
Lab Sample ID:	E2733-03DL	Matrix:	SOIL
Analytical Method:	SOM01.2VOAM	% Moisture:	0
Sample Wt/Vol:	5.14 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	100 uL	Test:	VOCMS Group1
GC Column:	RTX-VMS ID : 0.18	Level :	MED

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH052111.D	1		07/09/13	VH070913M

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	240	U J	37	120	240	ug/Kg
74-87-3	Chloromethane	240	U	49	120	240	ug/Kg
75-01-4	Vinyl chloride	240	U	38	120	240	ug/Kg
74-83-9	Bromomethane	240	U	44	120	240	ug/Kg
75-00-3	Chloroethane	240	U	32	120	240	ug/Kg
75-69-4	Trichlorofluoromethane	240	U	29	120	240	ug/Kg
75-35-4	1,1-Dichloroethene	240	U	49	120	240	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	240	U	60	120	240	ug/Kg
67-64-1	Acetone	13 J ~~490~~	~~U~~	134	245	490	ug/Kg
75-15-0	Carbon disulfide	240	U J	37	120	240	ug/Kg
79-20-9	Methyl Acetate	240	U J	88	120	240	ug/Kg
75-09-2	Methylene chloride	2.4 J ~~240~~	~~U~~	47	120	240	ug/Kg
156-60-5	trans-1,2-Dichloroethene	2 J ~~240~~	~~U~~	50	120	240	ug/Kg
1634-04-4	Methyl tert-butyl Ether	240	U J	45	120	240	ug/Kg
75-34-3	1,1-Dichloroethane	30 J ~~240~~	~~U~~	47	120	240	ug/Kg
156-59-2	cis-1,2-Dichloroethene	64	JD	43	120	240	ug/Kg
78-93-3	2-Butanone	490	U J	136	245	490	ug/Kg
74-97-5	Bromochloromethane	240	U J	51	120	240	ug/Kg
67-66-3	Chloroform	240	U J	57	120	240	ug/Kg
71-55-6	1,1,1-Trichloroethane	20 J ~~240~~	~~U~~	45	120	240	ug/Kg
110-82-7	Cyclohexane	240	U J	46	120	240	ug/Kg
56-23-5	Carbon tetrachloride	240	U J	40	120	240	ug/Kg
71-43-2	Benzene	59 J ~~240~~	~~U~~	47	120	240	ug/Kg
107-06-2	1,2-Dichloroethane	240	U J	54	120	240	ug/Kg
123-91-1	1,4-Dioxane	4900	U	1390	2450	4900	ug/Kg
79-01-6	Trichloroethene	670	D	46	120	240	ug/Kg
108-87-2	Methylcyclohexane	240	U	41	120	240	ug/Kg
78-87-5	1,2-Dichloropropane	240	U	64	120	240	ug/Kg
75-27-4	Bromodichloromethane	240	U	47	120	240	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	240	U	62	120	240	ug/Kg
108-10-1	4-Methyl-2-pentanone	490	U	113	245	490	ug/Kg

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	PWC-60(12-16)DL	SDG No.:	E2733
Lab Sample ID:	E2733-03DL	Matrix:	SOIL
Analytical Method:	SOM01.2VOAM	% Moisture:	0
Sample Wt/Vol:	5.14 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	100 uL	Test:	VOCMS Group1
GC Column:	RTX-VMS ID : 0.18	Level :	MED

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH052111.D	1		07/09/13	VH070913M

CAS Number	Parameter		Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
108-88-3	Toluene	8 J	~~240~~	~~U~~	44	120	240	ug/Kg
10061-02-6	trans-1,3-Dichloropropene		240	U J	39	120	240	ug/Kg
79-00-5	1,1,2-Trichloroethane	3.7 J	~~240~~	~~U~~	53	120	240	ug/Kg
127-18-4	Tetrachloroethene		240	U J	41	120	240	ug/Kg
591-78-6	2-Hexanone		490	U	83	245	490	ug/Kg
124-48-1	Dibromochloromethane		240	U	46	120	240	ug/Kg
106-93-4	1,2-Dibromoethane		240	U	36	120	240	ug/Kg
108-90-7	Chlorobenzene	250 EJ	~~240~~	~~U~~	46	120	240	ug/Kg
100-41-4	Ethylbenzene		240	U J	43	120	240	ug/Kg
95-47-6	o-xylene		240	U	38	120	240	ug/Kg
179601-23-1	m&p-xylenes		240	U	37	120	240	ug/Kg
100-42-5	Styrene		240	U	38	120	240	ug/Kg
75-25-2	Bromoform		240	U	36	120	240	ug/Kg
98-82-8	Isopropylbenzene		240	U	40	120	240	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane		240	U	35	120	240	ug/Kg
541-73-1	1,3-Dichlorobenzene		240	U	33	120	240	ug/Kg
106-46-7	1,4-Dichlorobenzene		240	U	41	120	240	ug/Kg
95-50-1	1,2-Dichlorobenzene		240	U	32	120	240	ug/Kg
96-12-8	1,2-Dibromo-3-chloropropane		240	U	30	120	240	ug/Kg
120-82-1	1,2,4-trichlorobenzene		240	U	40	120	240	ug/Kg
87-61-6	1,2,3-Trichlorobenzene		240	U	33	120	240	ug/Kg
SURROGATES								
6745-35-3	Vinyl Chloride-d3		81.7	*	68 - 122		163%	SPK: 50
19199-91-8	Chloroethane-d5		29.6	*	61 - 130		59%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2		48.1		45 - 132		96%	SPK: 50
24313-50-6	2-Butanone-d5		197	*	20 - 182		197%	SPK: 100
865-49-6	Chloroform-d		97.9	*	72 - 123		196%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4		100	*	79 - 122		202%	SPK: 50
1076-43-3	Benzene-d6		109	*	80 - 121		220%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6		98.4	*	74 - 124		197%	SPK: 50
2037-26-5	Toluene-d8		95	*	78 - 121		190%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4		90.1	*	72 - 130		180%	SPK: 50

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CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	PWC-60(12-16)DL	SDG No.:	E2733
Lab Sample ID:	E2733-03DL	Matrix:	SOIL
Analytical Method:	SOM01.2VOAM	% Moisture:	0
Sample Wt/Vol:	5.14 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	100 uL	Test:	VOCMS Group1
GC Column:	RTX-VMS ID : 0.18	Level :	MED

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH052111.D	1		07/09/13	VH070913M

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
4840-82-8	2-Hexanone-d5	183		17 - 184		183%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1311		50 - 150		105%	SPK: 1250
33685-54-0	1,1,2,2-Tetrachloroethane-d2	90.8	*	56 - 161		182%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	87.9	*	70 - 131		176%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	926065	9.76				
540-36-3	1,4-Difluorobenzene	1169890	5.61				
3855-82-1	1,4-Dichlorobenzene-d4	316299	12.51				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	ARC-115(4-8)	SDG No.:	E2733
Lab Sample ID:	E2733-01	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	17 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.82		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009606.D	1	07/01/13	07/02/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	40	U	2.2	20	40	ug/Kg
11104-28-2	Aroclor-1221	40	U	6.5	20	40	ug/Kg
11141-16-5	Aroclor-1232	40	U	1.1	20	40	ug/Kg
53469-21-9	Aroclor-1242	40	U	5.2	20	40	ug/Kg
12672-29-6	Aroclor-1248	4700	EP	2.3	20	40	ug/Kg
11097-69-1	Aroclor-1254	40	U	2.6	20	40	ug/Kg
11096-82-5	Aroclor-1260	40	U	2.6	20	40	ug/Kg
37324-23-5	Aroclor-1262	40	U	12	20	40	ug/Kg
11100-14-4	Aroclor-1268	40	U	5.5	20	40	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	69.3		30 - 150		116%	SPK: 60
2051-24-3	Decachlorobiphenyl	124		30 - 150		104%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	ARC-115(4-8)DL	SDG No.:	E2733
Lab Sample ID:	E2733-01DL	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	17 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.82		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009689.D	50	07/01/13	07/08/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	2000	U	110	1000	2000	ug/Kg
11104-28-2	Aroclor-1221	2000	U	320	1000	2000	ug/Kg
11141-16-5	Aroclor-1232	2000	U	54	1000	2000	ug/Kg
53469-21-9	Aroclor-1242	2000	U	260	1000	2000	ug/Kg
12672-29-6	Aroclor-1248	7500	~~D~~	110	1000	2000	ug/Kg
11097-69-1	Aroclor-1254	2000	U	130	1000	2000	ug/Kg
11096-82-5	Aroclor-1260	2000	U	130	1000	2000	ug/Kg
37324-23-5	Aroclor-1262	2000	U	590	1000	2000	ug/Kg
11100-14-4	Aroclor-1268	2000	U	280	1000	2000	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	~~88.5~~	D	30 - 150		148%	SPK: 60
2051-24-3	Decachlorobiphenyl	~~127~~	D	30 - 150		106%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	ARC-117(4-8)	SDG No.:	E2733
Lab Sample ID:	E2733-02	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	22 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.09		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009609.D	1	07/01/13	07/02/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	42	U	2.3	21	42	ug/Kg
11104-28-2	Aroclor-1221	42	U	6.9	21	42	ug/Kg
11141-16-5	Aroclor-1232	42	U	1.2	21	42	ug/Kg
53469-21-9	Aroclor-1242	42	U	5.5	21	42	ug/Kg
12672-29-6	Aroclor-1248	2700	EP	2.4	21	42	ug/Kg
11097-69-1	Aroclor-1254	42	U	2.8	21	42	ug/Kg
11096-82-5	Aroclor-1260	42	U	2.8	21	42	ug/Kg
37324-23-5	Aroclor-1262	42	U	13	21	42	ug/Kg
11100-14-4	Aroclor-1268	42	U	5.9	21	42	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	67.8		30 - 150		113%	SPK: 60
2051-24-3	Decachlorobiphenyl	116		30 - 150		97%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	ARC-117(4-8)DL	SDG No.:	E2733
Lab Sample ID:	E2733-02DL	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	22 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.09		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009690.D	100	07/01/13	07/08/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	4200	U	230	2100	4200	ug/Kg
11104-28-2	Aroclor-1221	4200	U	690	2100	4200	ug/Kg
11141-16-5	Aroclor-1232	4200	U	120	2100	4200	ug/Kg
53469-21-9	Aroclor-1242	4200	U	550	2100	4200	ug/Kg
12672-29-6	Aroclor-1248	26000	~~D~~	240	2100	4200	ug/Kg
11097-69-1	Aroclor-1254	4200	U	280	2100	4200	ug/Kg
11096-82-5	Aroclor-1260	4200	U	280	2100	4200	ug/Kg
37324-23-5	Aroclor-1262	4200	U	1300	2100	4200	ug/Kg
11100-14-4	Aroclor-1268	4200	U	590	2100	4200	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	~~549~~	~~*~~ D	30 - 150		915%	SPK: 60
2051-24-3	Decachlorobiphenyl	~~798~~	~~*~~ D	30 - 150		665%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

A B C D

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	HRDD-42(5.5-6.0)	SDG No.:	E2733
Lab Sample ID:	E2733-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	82.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.5	JN	1	0.18	2.7	5.4	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	5.5		1	0.26	0.445	0.89	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

A B C D

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	HRDD-43(5.5-6.0)	SDG No.:	E2733
Lab Sample ID:	E2733-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	79.2

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	0.52	~~JN~~	1	0.18	2.75	5.5	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	5.7		1	0.27	0.46	0.92	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Revised

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

A B C D

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	HRDD-44(5.5-6.0)	SDG No.:	E2733
Lab Sample ID:	E2733-06	Matrix:	SOIL
Level (low/med):	low	% Solid:	79.5

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	5.3	~~UN~~ J	1	0.18	2.65	5.3	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	3.6		1	0.26	0.445	0.89	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Revised

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB and Metals Analyses

SDG#E2756

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20272R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) #E2756 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB	PEST	MET
E2756	ARC-114(4-8)_06/28/13	E2756-01	Soil	06/28/2013				X		
	ARC-116(4-8)_06/28/13	E2756-02	Soil	06/28/2013				X		
	ARC-118(4-8)_06/28/13	E2756-03	Soil	06/28/2013				X		
	HRDD-43R(3.5-4)_06/28/13	E2756-06	Soil	06/28/2013				X		
	PWC-71_06/28/13	E2756-10	Soil	06/28/2013				X		
	PWC-73(0-16)_06/28/13	E2756-12	Soil	06/28/2013						X

Note: TCLP data was not validated in this 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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods SOM01.2_ PCB. Data were reviewed in accordance with the method specified criteria and USEPA National Functional Guidelines of June 2008.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% for each peak is allowed. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All peaks associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%). The closing continuing calibration standard must exhibit a %D less than the control limit (50%)

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires the surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD recoveries exceeded acceptance limit, however the concentration of the non-spiked aroclor in the sample exceeded the MS/MSD by greater than a factor of four. The data was not qualified.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the method established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Gel Permeation Chromatography Performance Analysis

The GPC calibration check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the resolution of the phthalate and methoxychlor peaks in the GPC calibration mixture are greater than 85% and the perylene and sulfur peaks greater than 90% baseline resolution.

The GPC calibration resolution is acceptable.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

10. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must be less than 25%.

All sample results associated with aroclors that exhibited a concentration greater than the linear range of the instrument calibration were reported from the analysis in which the aroclor is within calibration range.

Sample locations associated with %D analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	%D
ARC-114(4-8) DL	Aroclor 1248	29.2%
ARC-116(4-8)	Aroclor 1248	42.9%

The criteria used to evaluate the %D are presented in the following table. In the case of a %D deviation, the sample results are qualified as documented in the table below.

Control Limit (%D)	Qualification
Sample results >RL and %D >25% to 70%	J
Sample results >RL and %D >70% to 100%	JN
Sample results >RL and %D >100% [1]	R
Sample results >RL and %D >100% to 200% (Interference detected)[2]	J or JN
Sample results <RL and %D >50%	U

When the PCB sample results are less than the RL and the %D greater than 50% the sample result are raised to the RL and reported as nondetect.

Note 1: If the pattern is confirmed sample results will be qualified as estimated (J). If pattern exhibits interference or if the PCB cannot be positively determined due to weathering the sample results will be qualified as tentative identification estimate (JN).

Note 2: If interference is detected in either column the sample results will be qualified as tentative identification estimate (JN).

11. 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 VALIDATION CHECKLIST FOR PCBs

PCBs; SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. 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 Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Column (%D)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

Samples associated with SDG E2756 were qualified by the laboratory with an "N" qualifier due to matrix spike failure; however, the associated spiked sample was not associated with this SDG. The "N" qualifier will be removed.

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within 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 VALIDATION CHECKLIST FOR METAL

METALS/HG/CN; ILM05.4	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
ICP Serial Dilution					X
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: September 26, 2013

PEER REVIEW: Dennis Capria

DATE: October 3, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

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(908) 789-8900 Fax (908) 789-8922
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CHEMTECH PROJECT NO. E2756
QUOTE NO.
COC Number 029657

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: ARCADIS
ADDRESS: 105 Fieldcrest Ave, Suite 203
CITY: Edison STATE: NJ ZIP: 08837
ATTENTION: Moh Mahiuddin
PHONE: 732-661-3800 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Resources Corporation
PROJECT NO.: NJ5747 LOCATION: Sayreville
PROJECT MANAGER: Moh Mahiuddin
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: ARCADIS PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: see comments DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☒ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 PCB's	2 TAL Metals	3 TCLP VOC's	4 TCLP SVOC's	5 TCLP Metals	6 TCLP Pesticides	7	8	9	COMMENTS
1.	ARC-114 (4-8)	Soil	X		6/28/13	915	3	X									
2.	ARC-116 (4-8)	Soil	X		6/28/13	920	3	X									
3.	ARC-118 (4-8)	Soil	X		6/28/13	930	3	X									
4.	HRDD-42 (7.5-8)	Soil	X		6/28/13	1050	3		X								HOLD
5.	HRDD-42 (9.5-10)	Soil	X		6/28/13	1055	3		X								HOLD
6.	HRDD-43R (3.5-4)	Soil	X		6/28/13	1105	3		X								24 hour TAT
7.	HRDD-43 (7.5-8)	Soil	X		6/28/13	1110	3		X								HOLD
8.	HRDD-43 (9.5-10)	Soil	X		6/28/13	1150	3		X								HOLD
9.	HRDD-44 (7.5-8)	Soil	X		6/28/13	1200	3		X								HOLD
10.	PWC-71	Soil	X		6/28/13	1210	3	X		X	X	X	X				3 Day TAT

PRESERVATIVES

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME: 1400 6/28/13	RECEIVED BY:
1. [signature]		1. [signature]
RELINQUISHED BY: 2. [signature]	DATE/TIME:	RECEIVED BY: 2. [signature]
RELINQUISHED BY: 3. [signature]	DATE/TIME: 1445 6/28/13	RECEIVED FOR LAB BY: 3. [signature]

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 4°C
Ice in Cooler?: Yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

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CHAIN OF CUSTODY RECORD

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www.chemtech.net

CHEMTECH PROJECT NO. E2756
QUOTE NO.
COC Number: 029656

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: ARCADIS
ADDRESS: 105 Fieldcrest Ave, Suite 203
CITY: Edison STATE: NJ ZIP: 08837
ATTENTION: Moh Mahiuddin
PHONE: 732 661 3800 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Resources Corporation
PROJECT NO.: NJ5147 LOCATION: Sayreville
PROJECT MANAGER: Moh Mahiuddin
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: ARCADIS PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: see comments DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☒ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 TCLP VOC's
2 TCLP SVOC's
3 TCLP Metals
4 TCLP Pesticides/Herb
5 PCB's
6
7
8
9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS (← Specify Preservatives: A–HCl B–HNO_3 C–H_2SO_4 D–NaOH E–ICE F–Other)
1. 11	PWC-72 (0-16)	Soil	X		6/28/13	1220	3	X	X	X	X	X					HOLD
2. 12	PWC-73 (0-16)	Soil	X		6/28/13	1230	3	X	X	X	X	X					HOLD only {TCLP Pesticides, PCB's}
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	6/28/13 1400	1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 6/28/13 1445	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 4°C
Ice in Cooler?: Yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	ARC-114(4-8)	SDG No.:	E2756
Lab Sample ID:	E2756-01	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	22 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.36		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009610.D	1	07/01/13	07/02/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	42	U	2.3	21	42	ug/Kg
11104-28-2	Aroclor-1221	42	U	6.9	21	42	ug/Kg
11141-16-5	Aroclor-1232	42	U	1.2	21	42	ug/Kg
53469-21-9	Aroclor-1242	42	U	5.5	21	42	ug/Kg
12672-29-6	Aroclor-1248	10000	E	2.4	21	42	ug/Kg
11097-69-1	Aroclor-1254	42	U	2.8	21	42	ug/Kg
11096-82-5	Aroclor-1260	42	U	2.8	21	42	ug/Kg
37324-23-5	Aroclor-1262	42	U	13	21	42	ug/Kg
11100-14-4	Aroclor-1268	42	U	5.9	21	42	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	77.5		30 - 150		129%	SPK: 60
2051-24-3	Decachlorobiphenyl	152		30 - 150		127%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	ARC-114(4-8)DL	SDG No.:	E2756
Lab Sample ID:	E2756-01DL	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	22 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.36		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009691.D	100	07/01/13	07/08/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	4200	U	230	2100	4200	ug/Kg
11104-28-2	Aroclor-1221	4200	U	690	2100	4200	ug/Kg
11141-16-5	Aroclor-1232	4200	U	120	2100	4200	ug/Kg
53469-21-9	Aroclor-1242	4200	U	550	2100	4200	ug/Kg
12672-29-6	Aroclor-1248	24000	~~DP~~ J	240	2100	4200	ug/Kg
11097-69-1	Aroclor-1254	4200	U	280	2100	4200	ug/Kg
11096-82-5	Aroclor-1260	4200	U	280	2100	4200	ug/Kg
37324-23-5	Aroclor-1262	4200	U	1300	2100	4200	ug/Kg
11100-14-4	Aroclor-1268	4200	U	590	2100	4200	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	~~106~~	~~*~~ D	30 - 150		177%	SPK: 60
2051-24-3	Decachlorobiphenyl	~~196~~	~~*~~ D	30 - 150		163%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	ARC-116(4-8)	SDG No.:	E2756
Lab Sample ID:	E2756-02	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	18 Decanted:
Sample Wt/Vol:	30.09 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.31		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009611.D	1	07/01/13	07/02/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	40	U	2.2	20	40	ug/Kg
11104-28-2	Aroclor-1221	40	U	6.6	20	40	ug/Kg
11141-16-5	Aroclor-1232	40	U	1.1	20	40	ug/Kg
53469-21-9	Aroclor-1242	40	U	5.2	20	40	ug/Kg
12672-29-6	Aroclor-1248	350	J ~~P~~	2.3	20	40	ug/Kg
11097-69-1	Aroclor-1254	40	U	2.7	20	40	ug/Kg
11096-82-5	Aroclor-1260	40	U	2.7	20	40	ug/Kg
37324-23-5	Aroclor-1262	40	U	12	20	40	ug/Kg
11100-14-4	Aroclor-1268	40	U	5.6	20	40	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	64.9		30 - 150		108%	SPK: 60
2051-24-3	Decachlorobiphenyl	125		30 - 150		104%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	ARC-118(4-8)	SDG No.:	E2756
Lab Sample ID:	E2756-03	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	12 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.65		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009612.D	1	07/01/13	07/02/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	37	U	2	18.5	37	ug/Kg
11104-28-2	Aroclor-1221	37	U	6.1	18.5	37	ug/Kg
11141-16-5	Aroclor-1232	37	U	1	18.5	37	ug/Kg
53469-21-9	Aroclor-1242	37	U	4.9	18.5	37	ug/Kg
12672-29-6	Aroclor-1248	1900	EP	2.2	18.5	37	ug/Kg
11097-69-1	Aroclor-1254	37	U	2.5	18.5	37	ug/Kg
11096-82-5	Aroclor-1260	37	U	2.5	18.5	37	ug/Kg
37324-23-5	Aroclor-1262	37	U	11	18.5	37	ug/Kg
11100-14-4	Aroclor-1268	37	U	5.2	18.5	37	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	64.6		30 - 150		108%	SPK: 60
2051-24-3	Decachlorobiphenyl	126		30 - 150		106%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	ARC-118(4-8)DL	SDG No.:	E2756
Lab Sample ID:	E2756-03DL	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	12 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.65		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009692.D	10	07/01/13	07/08/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	370	U	20	185	370	ug/Kg
11104-28-2	Aroclor-1221	370	U	61	185	370	ug/Kg
11141-16-5	Aroclor-1232	370	U	10	185	370	ug/Kg
53469-21-9	Aroclor-1242	370	U	49	185	370	ug/Kg
12672-29-6	Aroclor-1248	1900	~~D~~	22	185	370	ug/Kg
11097-69-1	Aroclor-1254	370	U	25	185	370	ug/Kg
11096-82-5	Aroclor-1260	370	U	25	185	370	ug/Kg
37324-23-5	Aroclor-1262	370	U	110	185	370	ug/Kg
11100-14-4	Aroclor-1268	370	U	52	185	370	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	64		30 - 150		107%	SPK: 60
2051-24-3	Decachlorobiphenyl	95.2		30 - 150		79%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	PWC-71	SDG No.:	E2756
Lab Sample ID:	E2756-10	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	24 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 4.44		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO009613.D	1	07/01/13	07/02/13	PB70636

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	43	U	2.4	21.5	43	ug/Kg
11104-28-2	Aroclor-1221	43	U	7.1	21.5	43	ug/Kg
11141-16-5	Aroclor-1232	43	U	1.2	21.5	43	ug/Kg
53469-21-9	Aroclor-1242	43	U	5.6	21.5	43	ug/Kg
12672-29-6	Aroclor-1248	43	U	2.5	21.5	43	ug/Kg
11097-69-1	Aroclor-1254	43	U	2.9	21.5	43	ug/Kg
11096-82-5	Aroclor-1260	43	U	2.9	21.5	43	ug/Kg
37324-23-5	Aroclor-1262	43	U	13	21.5	43	ug/Kg
11100-14-4	Aroclor-1268	43	U	6	21.5	43	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	60.8		30 - 150		101%	SPK: 60
2051-24-3	Decachlorobiphenyl	116		30 - 150		97%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	06/28/13
Project:	ARC Sayreville PostEx	Date Received:	06/28/13
Client Sample ID:	HRDD-43R(3.5-4)	SDG No.:	E2756
Lab Sample ID:	E2756-06	Matrix:	SOIL
Level (low/med):	low	% Solid:	63.7

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	2.4	JN	1	0.21	3.2	6.4	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	56.7		1	0.31	0.55	1.1	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB and Metals Analyses

SDG#E2374 and E2572

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #21724R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # E2374 and E2572 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB	PEST	MET
E2374	HRDD-41(0.5-1)	E2374-01	Soil	5/22/2013		X	X	X	X	X
	HRDD-42(0.5-1)	E2374-02	Soil	5/22/2013		X	X	X	X	X
	HRDD-43(0.5-1)	E2374-03	Soil	5/22/2013		X	X	X	X	X
	HRDD-44(0.5-1)	E2374-04	Soil	5/22/2013		X	X	X	X	X
	DUP(052213)	E2374-05	Soil	5/22/2013	HRDD-44(0.5-1)		X	X	X	X
	FB(052213)	E2374-06	Soil	5/22/2013		X	X	X	X	X
E2572	HRDD-41(2-2.5)	E2572-01	Soil	6/14/2013						X
	HRDD-42(2-2.5)	E2572-03	Soil	6/14/2013						X
	HRDD-42(3.5-4)	E2572-04	Soil	6/14/2013						X
	HRDD-43(2-2.5)	E2572-05	Soil	6/14/2013						X
	HRDD-43(3.5-4)	E2572-06	Soil	6/14/2013						X
	HRDD-44(2-2.5)	E2572-07	Soil	6/14/2013						X
	HRDD-44(3.5-4)	E2572-08	Soil	6/14/2013						X
	DUP(061413)	E2572-09	Soil	6/14/2013	HRDD-41(2-2.5)					X
	EB(061413)	E2572-10	Soil	6/14/2013						X
	FB(061413)	E2572-11	Soil	6/14/2013						X

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods SOM01.2_VOC, SVOC, PEST, and PCB. Data were reviewed in accordance with the method specified criteria and USEPA National Functional Guidelines of June 2008.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2	Water	14 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	14 days from collection to analysis	Cool to <6°C; preserved with sodium bisulfate

s.u. Standard units

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, trip, 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. Trip blanks measure contamination of samples during shipment. Rinse blanks measure contamination of samples during field operations.

No compounds were detected in the associated blanks.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 15 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and a RRF value greater than control limit (0.05). All compounds listed in Table 15 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 15 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and a RRF value greater than control limit (0.05). All target compounds associated with the closing continuing calibration standard must exhibit a percent difference (%D) less than the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
HRDD-44(0.5-1)	Chloroform-d	AC
	1,2-Dichloroethane-d4	> UL
	Benzene-d6	AC
	Toluene-d8	AC
	1,2-Dichlorobenzene-d4	AC

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 21 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL) but > 20%	Non-detect	UJ
	Detect	J
< 20%	Non-detect	R
	Detect	J

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

All internal standard areas and retention times were within established limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a VOC sample within this data set.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Storage blanks		X		X	
C. Trip blanks					X
Laboratory Control Sample (LCS)					X
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
DMC Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					

%RSD	Relative standard deviation	%R	Percent recovery
RPD	Relative percent difference	%D	Percent difference

SEMI-VOLATILE VOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 1.2 SVOC	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction 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.

No compounds were detected above the MDL in the associated blanks.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 28 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and an RRF value greater than control limit (0.05). All compounds listed in Table 28 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 28 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and RRF value greater than control limit (0.05). All target compounds not listed associated with the closing continuing calibration standard must exhibit a percent difference (%D) less then the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	Recovery
HRDD-41(0.5-1) HRDD-44(0.5-1)	Pyrene-d10	< LL but >10%
	Benzo(a)pyrene-d12	< LL but >10%
HRDD-42(0.5-1)	Pyrene-d10	< LL but >10%
	Benzo(a)pyrene-d12	AC

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 34 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL)	Non-detect	UJ or R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	No Action
	Detect	

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC to exhibit area counts that are not greater than two times (+200%) or less than one-half (-50%) the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

All internal standard areas and retention times were within established limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compounds concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not spiked with the reported compounds. The data was not qualified.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	All compounds	U	U	AC

AC Acceptable

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

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate(MSD) %R					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

PESTICIDES ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

The instrument performance checks are performed to ensure adequate resolution and instrument sensitivity.

3.1 Resolution Check Mixture

The resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 80% for all analytes on the primary column and greater than or equal to 50% for the confirmation column when one Individual Standard Mixture (C) is used. If two Individual Standard Mixtures (A and B) are used, the resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 60%.

3.2 Performance Evaluation Mixture (PEM)

The resolution between any two adjacent peaks in the Performance Evaluation Mixture (PEM) must be greater than or equal to 90% on each column. In addition, the percent breakdown of 4,4'-DDT and Endrin in the PEMs must each be less than or equal to 20% for each column and the combined percent breakdown must be less than or equal to 30% on each column.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The maximum RSD allowed is 20% for all target compounds with the exception of 25% for alpha-BHC and delta-BHC and 30% for toxaphene.

4.2 Continuing Calibration

All target compounds associated with the Performance Evaluation Mixture (PEM) must exhibit a percent difference (%D) less than the control limit (25%). All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) for the calibration factor less than the control limit (20%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. Pesticides analysis requires the two pesticides surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit a RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Florisil Cartridge Performance Check

The performance of each lot of Florisil cartridges used for sample cleanup must be checked at least once, or every six months. The performance check is acceptable if the recovery of the target pesticide compounds and surrogates in the Individual Standard Mixture (A) are 80 to 120% and the recovery limit for 2,4,5-trichlorophenol is less than 5%.

The performance check recoveries were within acceptable limits.

9. Gel Permeation Chromatography Performance Analysis

The GPC check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the recoveries of the pesticides in the GPC continuing calibration verification solution are within 80 to 110%.

The GPC calibration recoveries were within acceptable limits.

10. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	All compounds	U	U	AC

AC Acceptable

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

11. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must less than 25%.

The dual column analysis exhibited acceptable %D.

12. 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 VALIDATION CHECKLIST FOR PESTICIDES

SVOCs: SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate(LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)		X		X	
Matrix Spike Duplicate(MSD)		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Column %D $\leq$ 25%		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/confirmation		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% for each peak is allowed. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All peaks associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%). The closing continuing calibration standard must exhibit a %D less than the control limit (50%)

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires the surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
HRDD-41(0.5-1)	Aroclor 1260

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	No action
	Detect	No action

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the method established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Gel Permeation Chromatography Performance Analysis

The GPC calibration check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the resolution of the phthalate and methoxychlor peaks in the GPC calibration mixture are greater than 85% and the perylene and sulfur peaks greater than 90% baseline resolution.

The GPC calibration resolution is acceptable.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	All compounds	U	U	AC

AC Acceptable

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

10. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must be less than 25%.

The dual column analysis exhibited acceptable %D.

11. 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 VALIDATION CHECKLIST FOR PCBs

PCBs; SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. 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 Duplicate (RPD)		X		X	
Surrogate Spike Recoveries		X		X	
Column (%D)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery
HRDD-41(0.5-1)	Antimony	68%
	Arsenic	1.0%
HRDD-41(2-2.5)	Antimony	68%
	Arsenic	147%

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

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

A post spike (PS) was performed as required when matrix spike recoveries are outside control limits. The post spike results were evaluated as presented in the table below.

Sample Location	Analyte	MS Recovery	PS Recovery
HRDD-41(0.5-1)	Arsenic	1.0%	90.2%

The sample results will be qualified as presented in the following table. The qualifications are applied to all sample results associated with this SDG.

Control limit	Post Spike	Sample Result	Qualification
MS/MSD percent recovery <30%	PS percent recovery >75%	Non-detect	UJ
		Detect	J
	PS percent recovery <75%	Non-detect	R
		Detect	J

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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	Compound	Sample Result	Duplicate Result	RPD
HRDD-44(0.5-1)/DUP(052213)	Antimony	28.3	30.2	6.5%
	Arsenic	697	932	28.9%
HRDD-41(2-2.5)/DUP(061413)	Antimony	1.1 J	1.2 J	AC
	Arsenic	9	13.8	42.1%

AC Acceptable

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

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within control limits, with the exception of the analytes presented in the following table. The sample locations associated with the deviant %D are also presented in the following table.

Sample Locations	Analytes	Serial Dilution (%D)
HRDD-41(0.5-1)	Arsenic	15%

The criteria used to evaluate the serial dilution are presented in the following table. In the case of a serial dilution deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

8. System Performance and Overall Assessment

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
HRDD-43(3.5-4)	Arsenic	1660 E	1680 D	1680 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentration greater than the linear range qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

DATA VALIDATION CHECKLIST FOR METAL

METALS/HG/CN; ILM05.4	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution		X	X		
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: May 23, 2014

PEER REVIEW: Dennis Capria

DATE: June 4, 2014

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2374
QUOTE NO.
COC Number 029499

CLIENT INFORMATION (REPORT TO BE SENT TO:)
COMPANY: Arcadis
ADDRESS: 105 Fieldcrest Ave suite 203
CITY: Edison STATE: NJ ZIP:
ATTENTION: JASON FLAGG
PHONE: 732-667-3800 FAX: 732-661-5067

CLIENT PROJECT INFORMATION
PROJECT NAME: ATLANTIC RESOURCES CORPORATION
PROJECT NO.: NJ514.7.1 LOCATION: SAYREVILLE, NJ
PROJECT MANAGER: MOH MOHIUDDIN
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION
BILL TO: PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION
FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION
☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☒ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 VOC (None)	2 Group 1 parameters (None)	3 Waste characterization (None)	4 Metals (HNO3)	5 VOCs (HCl)	6 SVOCs (None)	7 Pesticides (None)	8	9	COMMENTS
1.	HRDD-41(0.5-1)	S		X	5/22/13	1105	4	X	X								
2.	HRDD-42(0.5-1)	S		X	5/22/13	1115	4	X	X								
3.	HRDD-43(0.5-1)	S		X	5/22/13	1125	4	X	X								
4.	HRDD-44(0.5-1)	S		X	5/22/13	1135	4	X	X								
5.	DUP(052213)	S		X	5/22/13	—	4	X	X								
6.	WC-15	S	X		5/22/13	1145	4			X							
7.	FB(052213)	FB			5/22/13	1330	6				X	X	X	X			
8.																	
9.																	
10.																	

PRESERVATIVES: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	5-23-13 1305	1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 5-23-13 1445	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant Cooler Temp. 4°C
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Ice in Cooler?: ✓

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	32
Sample Wt/Vol:	5.67 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048758.D	1		05/24/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	6.5	U	1.3	3.25	6.5	ug/Kg
71-43-2	Benzene	6.5	U	1.3	3.25	6.5	ug/Kg
79-01-6	Trichloroethene	6.5	U	1.2	3.25	6.5	ug/Kg
108-88-3	Toluene	6.5	U	1.2	3.25	6.5	ug/Kg
127-18-4	Tetrachloroethene	6.5	U	1.1	3.25	6.5	ug/Kg
95-47-6	o-xylene	6.5	U	1	3.25	6.5	ug/Kg
179601-23-1	m&p-xylenes	6.5	U	1	3.25	6.5	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	54.4		68 - 122		109%	SPK: 50
19199-91-8	Chloroethane-d5	63.4		61 - 130		127%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	41.9		45 - 132		84%	SPK: 50
24313-50-6	2-Butanone-d5	86.9		20 - 182		87%	SPK: 100
865-49-6	Chloroform-d	55.5		72 - 123		111%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	60.4		79 - 122		121%	SPK: 50
1076-43-3	Benzene-d6	54.3		80 - 121		109%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	52.6		74 - 124		105%	SPK: 50
2037-26-5	Toluene-d8	53.1		78 - 121		106%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	43		72 - 130		86%	SPK: 50
4840-82-8	2-Hexanone-d5	59.4		17 - 184		59%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1240		50 - 150		124%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	72.9		56 - 161		146%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	65.5	*	70 - 131		131%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	436821	10.67				
540-36-3	1,4-Difluorobenzene	572306	7.6				
3855-82-1	1,4-Dichlorobenzene-d4	158380	12.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	40
Sample Wt/Vol:	4.68 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048759.D	1		05/24/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	8.9	U	1.7	4.45	8.9	ug/Kg
71-43-2	Benzene	8.9	U	1.7	4.45	8.9	ug/Kg
79-01-6	Trichloroethene	8.9	U	1.7	4.45	8.9	ug/Kg
108-88-3	Toluene	8.9	U	1.6	4.45	8.9	ug/Kg
127-18-4	Tetrachloroethene	8.9	U	1.5	4.45	8.9	ug/Kg
95-47-6	o-xylene	8.9	U	1.4	4.45	8.9	ug/Kg
179601-23-1	m&p-xylenes	8.9	U	1.4	4.45	8.9	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	52.1		68 - 122		104%	SPK: 50
19199-91-8	Chloroethane-d5	61.6		61 - 130		123%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	40.1		45 - 132		80%	SPK: 50
24313-50-6	2-Butanone-d5	89.1		20 - 182		89%	SPK: 100
865-49-6	Chloroform-d	56.4		72 - 123		113%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	60.3		79 - 122		121%	SPK: 50
1076-43-3	Benzene-d6	58.3		80 - 121		117%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	57.7		74 - 124		115%	SPK: 50
2037-26-5	Toluene-d8	53.2		78 - 121		106%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	48		72 - 130		96%	SPK: 50
4840-82-8	2-Hexanone-d5	68.2		17 - 184		68%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1319		50 - 150		132%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	76.2		56 - 161		152%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	54.6		70 - 131		109%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	371438	10.67				
540-36-3	1,4-Difluorobenzene	542520	7.6				
3855-82-1	1,4-Dichlorobenzene-d4	129813	12.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	27
Sample Wt/Vol:	5.53 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048762.D	1		05/24/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	6.2	U	1.2	3.1	6.2	ug/Kg
71-43-2	Benzene	6.2	U	1.2	3.1	6.2	ug/Kg
79-01-6	Trichloroethene	6.2	U	1.2	3.1	6.2	ug/Kg
108-88-3	Toluene	6.2	U	1.1	3.1	6.2	ug/Kg
127-18-4	Tetrachloroethene	6.2	U	1	3.1	6.2	ug/Kg
95-47-6	o-xylene	6.2	U	0.96	3.1	6.2	ug/Kg
179601-23-1	m&p-xylenes	6.2	U	0.95	3.1	6.2	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	49.8		68 - 122		100%	SPK: 50
19199-91-8	Chloroethane-d5	55.7		61 - 130		111%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	38.4		45 - 132		77%	SPK: 50
24313-50-6	2-Butanone-d5	79		20 - 182		79%	SPK: 100
865-49-6	Chloroform-d	53.2		72 - 123		106%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	56.3		79 - 122		113%	SPK: 50
1076-43-3	Benzene-d6	51.4		80 - 121		103%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	50.3		74 - 124		101%	SPK: 50
2037-26-5	Toluene-d8	48.8		78 - 121		98%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	42.9		72 - 130		86%	SPK: 50
4840-82-8	2-Hexanone-d5	51.4		17 - 184		51%	SPK: 100
17647-74-4	1,4-Dioxane-d8	929		50 - 150		93%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	66		56 - 161		132%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	60.2		70 - 131		120%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	483604	10.67				
540-36-3	1,4-Difluorobenzene	646470	7.59				
3855-82-1	1,4-Dichlorobenzene-d4	152474	12.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_VOA	% Moisture:	42
Sample Wt/Vol:	4.37 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VK048763.D	1		05/25/13	VK052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	9.9	U	1.9	4.95	9.9	ug/Kg
71-43-2	Benzene	9.9	U	1.9	4.95	9.9	ug/Kg
79-01-6	Trichloroethene	9.9	U	1.9	4.95	9.9	ug/Kg
108-88-3	Toluene	9.9	U	1.8	4.95	9.9	ug/Kg
127-18-4	Tetrachloroethene	9.9	U	1.7	4.95	9.9	ug/Kg
95-47-6	o-xylene	9.9	U	1.5	4.95	9.9	ug/Kg
179601-23-1	m&p-xylenes	9.9	U	1.5	4.95	9.9	ug/Kg
SURROGATES							
6745-35-3	Vinyl Chloride-d3	50.7		68 - 122		101%	SPK: 50
19199-91-8	Chloroethane-d5	58.4		61 - 130		117%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	39.8		45 - 132		80%	SPK: 50
24313-50-6	2-Butanone-d5	105		20 - 182		106%	SPK: 100
865-49-6	Chloroform-d	54.4		72 - 123		109%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	61.3	*	79 - 122		123%	SPK: 50
1076-43-3	Benzene-d6	48.6		80 - 121		97%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	49.1		74 - 124		98%	SPK: 50
2037-26-5	Toluene-d8	46.5		78 - 121		93%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	45.6		72 - 130		91%	SPK: 50
4840-82-8	2-Hexanone-d5	72.5		17 - 184		73%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1454		50 - 150		145%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	76.4		56 - 161		153%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	56.6		70 - 131		113%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	459496	10.67				
540-36-3	1,4-Difluorobenzene	568738	7.59				
3855-82-1	1,4-Dichlorobenzene-d4	145318	12.6				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_VOA	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH051834.D	1		05/24/13	VH052413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-09-2	Methylene chloride	5	U	1.1	2.5	5	ug/L
71-43-2	Benzene	5	U	1.7	2.5	5	ug/L
79-01-6	Trichloroethene	5	U	2.1	2.5	5	ug/L
108-88-3	Toluene	5	U	1.7	2.5	5	ug/L
127-18-4	Tetrachloroethene	5	U	2.1	2.5	5	ug/L
95-47-6	o-xylene	5	U	1.6	2.5	5	ug/L
179601-23-1	m&p-xylenes	5	U	1.8	2.5	5	ug/L
SURROGATES							
6745-35-3	Vinyl Chloride-d3	52.9		65 - 131		106%	SPK: 50
19199-91-8	Chloroethane-d5	54.4		71 - 131		109%	SPK: 50
22280-73-5	1,1-Dichloroethene-d2	38.9		55 - 104		78%	SPK: 50
24313-50-6	2-Butanone-d5	109		49 - 155		109%	SPK: 100
865-49-6	Chloroform-d	50.9		78 - 121		102%	SPK: 50
17060-07-0	1,2-Dichloroethane-d4	54.5		78 - 129		109%	SPK: 50
1076-43-3	Benzene-d6	52.9		77 - 124		106%	SPK: 50
93952-08-0	1,2-Dichloropropane-d6	54.3		79 - 124		109%	SPK: 50
2037-26-5	Toluene-d8	51.9		77 - 121		104%	SPK: 50
93951-86-1	trans-1,3-Dichloropropene-d4	44.9		73 - 121		90%	SPK: 50
4840-82-8	2-Hexanone-d5	111		28 - 135		111%	SPK: 100
17647-74-4	1,4-Dioxane-d8	1555	*	50 - 150		156%	SPK: 1000
33685-54-0	1,1,2,2-Tetrachloroethane-d2	47.2		73 - 125		94%	SPK: 50
2199-69-1	1,2-Dichlorobenzene-d4	49.4		80 - 131		99%	SPK: 50
INTERNAL STANDARDS							
3114-55-4	Chlorobenzene-d5	515246	9.76				
540-36-3	1,4-Difluorobenzene	592752	5.62				
3855-82-1	1,4-Dichlorobenzene-d4	217005	12.51				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)			SDG No.:	E2374
Lab Sample ID:	E2374-01			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	32
Sample Wt/Vol:	30.06	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 5.97

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010070.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	250	U J	75	125	250	ug/Kg
218-01-9	Chrysene	250	U	76	125	250	ug/Kg
205-99-2	Benzo(b)fluoranthene	250	U	100	125	250	ug/Kg
207-08-9	Benzo(k)fluoranthene	250	U	85	125	250	ug/Kg
50-32-8	Benzo(a)pyrene	250	U	81	125	250	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	250	U	75	125	250	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	250	U	91	125	250	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	13.3		12 - 98		33%	SPK: 40
93951-73-6	2-Chlorophenol-d4	17.5		13 - 101		44%	SPK: 40
190780-66-6	4-Methylphenol-d8	10.6		8 - 100		26%	SPK: 40
4165-60-0	Nitrobenzene-d5	16.3		16 - 103		41%	SPK: 40
93951-78-1	2-Nitrophenol-d4	15.1		16 - 104		38%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	13.8		23 - 104		35%	SPK: 40
191656-33-4	4-Chloroaniline-d4	14.2		1 - 145		36%	SPK: 40
85448-30-2	Dimethylphthalate-d6	1.3	*	43 - 111		3%	SPK: 40
93951-97-4	Acenaphthylene-d8	15.3		20 - 97		38%	SPK: 40
93951-79-2	4-Nitrophenol-d4	10.9		16 - 166		27%	SPK: 40
81103-79-9	Fluorene-d10	14.5	*	40 - 108		36%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	4.32		1 - 121		11%	SPK: 40
1719-06-8	Anthracene-d10	14		22 - 98		35%	SPK: 40
1718-52-1	Pyrene-d10	13.3	*	51 - 120		33%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	10.1	*	43 - 111		25%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	164973	6.62				
1146-65-2	Naphthalene-d8	632560	8.75				
15067-26-2	Acenaphthene-d10	434221	11.69				
1517-22-2	Phenanthrene-d10	817462	14.14				
1719-03-5	Chrysene-d12	1019320	18.51				
1520-96-3	Perylene-d12	917139	21.61				

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Report of Analysis

Client:	Arcadis			Date Collected:	05/22/13
Project:	ARC Sayreville PostEx			Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)			SDG No.:	E2374
Lab Sample ID:	E2374-02			Matrix:	SOIL
Analytical Method:	SOM01.2_BNA			% Moisture:	40
Sample Wt/Vol:	30	Units:	g	Final Vol:	500 uL
Soil Aliquot Vol:			uL	Test:	SVOCMS Group1
Extraction Type :	SOXH	Decanted :	N	Level :	LOW
Injection Volume :	1	GPC Factor :	2.0	GPC Cleanup :	Y PH : 6.97

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010071.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	280	U J	85	140	280	ug/Kg
218-01-9	Chrysene	280	U J	87	140	280	ug/Kg
205-99-2	Benzo(b)fluoranthene	280	U	120	140	280	ug/Kg
207-08-9	Benzo(k)fluoranthene	280	U	97	140	280	ug/Kg
50-32-8	Benzo(a)pyrene	280	U	92	140	280	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	280	U	85	140	280	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	280	U	100	140	280	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	14.5		12 - 98		36%	SPK: 40
93951-73-6	2-Chlorophenol-d4	18.2		13 - 101		45%	SPK: 40
190780-66-6	4-Methylphenol-d8	13.6		8 - 100		34%	SPK: 40
4165-60-0	Nitrobenzene-d5	18.2		16 - 103		46%	SPK: 40
93951-78-1	2-Nitrophenol-d4	18		16 - 104		45%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	16.4		23 - 104		41%	SPK: 40
191656-33-4	4-Chloroaniline-d4	18.4		1 - 145		46%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.38	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	18.4		20 - 97		46%	SPK: 40
93951-79-2	4-Nitrophenol-d4	12.6		16 - 166		32%	SPK: 40
81103-79-9	Fluorene-d10	17.8		40 - 108		44%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	3.51		1 - 121		9%	SPK: 40
1719-06-8	Anthracene-d10	19		22 - 98		47%	SPK: 40
1718-52-1	Pyrene-d10	19.8	*	51 - 120		49%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	18		43 - 111		45%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	168787	6.62				
1146-65-2	Naphthalene-d8	605758	8.74				
15067-26-2	Acenaphthene-d10	412105	11.69				
1517-22-2	Phenanthrene-d10	750269	14.14				
1719-03-5	Chrysene-d12	916536	18.51				
1520-96-3	Perylene-d12	838819	21.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	27
Sample Wt/Vol:	30.08 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 7.09

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010072.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	230	U	70	115	230	ug/Kg
218-01-9	Chrysene	230	U	71	115	230	ug/Kg
205-99-2	Benzo(b)fluoranthene	230	U	97	115	230	ug/Kg
207-08-9	Benzo(k)fluoranthene	230	U	79	115	230	ug/Kg
50-32-8	Benzo(a)pyrene	230	U	75	115	230	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	230	U	70	115	230	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	230	U	85	115	230	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	17.3		12 - 98		43%	SPK: 40
93951-73-6	2-Chlorophenol-d4	21.7		13 - 101		54%	SPK: 40
190780-66-6	4-Methylphenol-d8	18.4		8 - 100		46%	SPK: 40
4165-60-0	Nitrobenzene-d5	19.2		16 - 103		48%	SPK: 40
93951-78-1	2-Nitrophenol-d4	19.4		16 - 104		49%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	19.5		23 - 104		49%	SPK: 40
191656-33-4	4-Chloroaniline-d4	21.4		1 - 145		53%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.39	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	21.2		20 - 97		53%	SPK: 40
93951-79-2	4-Nitrophenol-d4	14.9		16 - 166		37%	SPK: 40
81103-79-9	Fluorene-d10	20.9		40 - 108		52%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	3.97		1 - 121		10%	SPK: 40
1719-06-8	Anthracene-d10	21.7		22 - 98		54%	SPK: 40
1718-52-1	Pyrene-d10	23.3		51 - 120		58%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	19.6		43 - 111		49%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	166239	6.62				
1146-65-2	Naphthalene-d8	636713	8.75				
15067-26-2	Acenaphthene-d10	432791	11.69				
1517-22-2	Phenanthrene-d10	816624	14.15				
1719-03-5	Chrysene-d12	958736	18.51				
1520-96-3	Perylene-d12	892577	21.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	42
Sample Wt/Vol:	30.05 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 7.10

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010073.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	290	U J	88	145	290	ug/Kg
218-01-9	Chrysene	290	U	90	145	290	ug/Kg
205-99-2	Benzo(b)fluoranthene	290	U	120	145	290	ug/Kg
207-08-9	Benzo(k)fluoranthene	290	U	100	145	290	ug/Kg
50-32-8	Benzo(a)pyrene	290	U	95	145	290	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	290	U	88	145	290	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	290	U	110	145	290	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	16.1		12 - 98		40%	SPK: 40
93951-73-6	2-Chlorophenol-d4	20.6		13 - 101		51%	SPK: 40
190780-66-6	4-Methylphenol-d8	14.9		8 - 100		37%	SPK: 40
4165-60-0	Nitrobenzene-d5	20.3		16 - 103		51%	SPK: 40
93951-78-1	2-Nitrophenol-d4	18.2		16 - 104		46%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	17.6		23 - 104		44%	SPK: 40
191656-33-4	4-Chloroaniline-d4	20		1 - 145		50%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.37	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	18.9		20 - 97		47%	SPK: 40
93951-79-2	4-Nitrophenol-d4	13.4		16 - 166		34%	SPK: 40
81103-79-9	Fluorene-d10	18.9		40 - 108		47%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	4.08		1 - 121		10%	SPK: 40
1719-06-8	Anthracene-d10	19.1		22 - 98		48%	SPK: 40
1718-52-1	Pyrene-d10	18.8	*	51 - 120		47%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	15.2	*	43 - 111		38%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	175498	6.62				
1146-65-2	Naphthalene-d8	638366	8.75				
15067-26-2	Acenaphthene-d10	444773	11.69				
1517-22-2	Phenanthrene-d10	820034	14.14				
1719-03-5	Chrysene-d12	989743	18.51				
1520-96-3	Perylene-d12	896746	21.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Analytical Method:	SOM01.2_BNA	% Moisture:	41
Sample Wt/Vol:	30.04 Units: g	Final Vol:	500 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	SOXH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 2.0	GPC Cleanup :	Y PH : 6.96

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010074.D	1	05/28/13	05/29/13	PB70055

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	290	U	86	145	290	ug/Kg
218-01-9	Chrysene	290	U	88	145	290	ug/Kg
205-99-2	Benzo(b)fluoranthene	290	U	120	145	290	ug/Kg
207-08-9	Benzo(k)fluoranthene	290	U	98	145	290	ug/Kg
50-32-8	Benzo(a)pyrene	290	U	93	145	290	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	290	U	86	145	290	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	290	U	100	145	290	ug/Kg
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	16		12 - 98		40%	SPK: 40
93951-73-6	2-Chlorophenol-d4	21.1		13 - 101		53%	SPK: 40
190780-66-6	4-Methylphenol-d8	15.9		8 - 100		40%	SPK: 40
4165-60-0	Nitrobenzene-d5	19.7		16 - 103		49%	SPK: 40
93951-78-1	2-Nitrophenol-d4	20		16 - 104		50%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	18		23 - 104		45%	SPK: 40
191656-33-4	4-Chloroaniline-d4	20.3		1 - 145		51%	SPK: 40
85448-30-2	Dimethylphthalate-d6	0.37	*	43 - 111		1%	SPK: 40
93951-97-4	Acenaphthylene-d8	20.7		20 - 97		52%	SPK: 40
93951-79-2	4-Nitrophenol-d4	15.3		16 - 166		38%	SPK: 40
81103-79-9	Fluorene-d10	20.2		40 - 108		51%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	4.21		1 - 121		11%	SPK: 40
1719-06-8	Anthracene-d10	20.8		22 - 98		52%	SPK: 40
1718-52-1	Pyrene-d10	21.8		51 - 120		54%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	18.2		43 - 111		46%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	167854	6.62				
1146-65-2	Naphthalene-d8	620555	8.75				
15067-26-2	Acenaphthene-d10	417461	11.69				
1517-22-2	Phenanthrene-d10	791123	14.14				
1719-03-5	Chrysene-d12	952584	18.5				
1520-96-3	Perylene-d12	885135	21.61				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_BNA	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group1
Extraction Type :	CONH Decanted : N	Level :	LOW
Injection Volume :	1 GPC Factor : 1.0	GPC Cleanup :	N PH : 5

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG010063.D	1	05/28/13	05/28/13	PB70052

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
56-55-3	Benzo(a)anthracene	5	U	0.9	2.5	5	ug/L
218-01-9	Chrysene	5	U	1.1	2.5	5	ug/L
205-99-2	Benzo(b)fluoranthene	5	U	0.75	2.5	5	ug/L
207-08-9	Benzo(k)fluoranthene	5	U	1.7	2.5	5	ug/L
50-32-8	Benzo(a)pyrene	5	U	2.5	2.5	5	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	5	U	1.7	2.5	5	ug/L
53-70-3	Dibenzo(a,h)anthracene	5	U	0.52	2.5	5	ug/L
SURROGATES							
93952-02-4	Bis(2-Chloroethyl)ether-d8	31.5		40 - 105		79%	SPK: 40
93951-73-6	2-Chlorophenol-d4	27.6		41 - 106		69%	SPK: 40
190780-66-6	4-Methylphenol-d8	19.6		25 - 111		49%	SPK: 40
4165-60-0	Nitrobenzene-d5	33		43 - 108		83%	SPK: 40
93951-78-1	2-Nitrophenol-d4	32.7		40 - 108		82%	SPK: 40
93951-74-7	2,4-Dichlorophenol-d3	30.3		37 - 105		76%	SPK: 40
191656-33-4	4-Chloroaniline-d4	0.74		1 - 145		2%	SPK: 40
85448-30-2	Dimethylphthalate-d6	37.1		47 - 114		93%	SPK: 40
93951-97-4	Acenaphthylene-d8	34.9		41 - 107		87%	SPK: 40
93951-79-2	4-Nitrophenol-d4	7.11	*	33 - 116		18%	SPK: 40
81103-79-9	Fluorene-d10	35		42 - 111		88%	SPK: 40
93951-76-9	4,6-Dinitro-2-methylphenol-d2	31.1		22 - 104		78%	SPK: 40
1719-06-8	Anthracene-d10	35.6		44 - 110		89%	SPK: 40
1718-52-1	Pyrene-d10	36.8		52 - 119		92%	SPK: 40
63466-71-7	Benzo(a)pyrene-d12	34.2		32 - 121		86%	SPK: 40
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	193546	6.63				
1146-65-2	Naphthalene-d8	726670	8.75				
15067-26-2	Acenaphthene-d10	496047	11.69				
1517-22-2	Phenanthrene-d10	955656	14.15				
1719-03-5	Chrysene-d12	1178640	18.51				
1520-96-3	Perylene-d12	1068200	21.6				

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	32 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 5.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003747.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.5	U	0.14	1.25	2.5	ug/Kg
60-57-1	Dieldrin	4.8	U	0.89	2.4	4.8	ug/Kg
72-43-5	Methoxychlor	25	U	0.11	12.5	25	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	48		30 - 150		80%	SPK: 60
2051-24-3	Decachlorobiphenyl	92.8		30 - 150		77%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	39.7 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 6.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003748.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.8	U	0.16	1.4	2.8	ug/Kg
60-57-1	Dieldrin	5.5	U	1	2.75	5.5	ug/Kg
72-43-5	Methoxychlor	28	U	0.13	14	28	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	51.6		30 - 150		86%	SPK: 60
2051-24-3	Decachlorobiphenyl	100		30 - 150		84%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
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N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	27.4 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 7.09		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003749.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.3	U	0.13	1.15	2.3	ug/Kg
60-57-1	Dieldrin	4.5	U	0.83	2.25	4.5	ug/Kg
72-43-5	Methoxychlor	23	U	0.11	11.5	23	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	50		30 - 150		83%	SPK: 60
2051-24-3	Decachlorobiphenyl	97.6		30 - 150		81%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	41.7 Decanted:
Sample Wt/Vol:	30.03 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 7.10		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003750.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.9	U	0.17	1.45	2.9	ug/Kg
60-57-1	Dieldrin	5.7	U	1	2.85	5.7	ug/Kg
72-43-5	Methoxychlor	29	U	0.13	14.5	29	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	60.1		30 - 150		100%	SPK: 60
2051-24-3	Decachlorobiphenyl	111		30 - 150		93%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Analytical Method:	SOM01.2_Pest	% Moisture:	41.2 Decanted:
Sample Wt/Vol:	30.08 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	2.0 PH : 6.96		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003751.D	1	05/28/13	05/29/13	PB70054

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	2.9	U	0.16	1.45	2.9	ug/Kg
60-57-1	Dieldrin	5.6	U	1	2.8	5.6	ug/Kg
72-43-5	Methoxychlor	29	U	0.13	14.5	29	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	53.7		30 - 150		90%	SPK: 60
2051-24-3	Decachlorobiphenyl	102		30 - 150		85%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Analytical Method:	SOM01.2_Pest	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL003744.D	1	05/28/13	05/29/13	PB70051

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
309-00-2	Aldrin	0.05	U	0.0024	0.025	0.05	ug/L
60-57-1	Dieldrin	0.1	U	0.0021	0.05	0.1	ug/L
72-43-5	Methoxychlor	0.5	U	0.0055	0.25	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	63.1		30 - 150		105%	SPK: 60
2051-24-3	Decachlorobiphenyl	105		30 - 150		88%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	32 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 5.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005654.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	48	U	2.6	24	48	ug/Kg
11104-28-2	Aroclor-1221	48	U	7.9	24	48	ug/Kg
11141-16-5	Aroclor-1232	48	U	1.3	24	48	ug/Kg
53469-21-9	Aroclor-1242	48	U	6.3	24	48	ug/Kg
12672-29-6	Aroclor-1248	48	U	2.8	24	48	ug/Kg
11097-69-1	Aroclor-1254	48	U	3.2	24	48	ug/Kg
11096-82-5	Aroclor-1260	48	U	3.2	24	48	ug/Kg
37324-23-5	Aroclor-1262	48	U	14	24	48	ug/Kg
11100-14-4	Aroclor-1268	48	U	6.8	24	48	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	45.2		30 - 150		75%	SPK: 60
2051-24-3	Decachlorobiphenyl	97.4		30 - 150		81%	SPK: 120

U = Not Detected
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MDL = Method Detection Limit
LOD = Limit of Detection
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P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	40 Decanted:
Sample Wt/Vol:	30.05 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 6.97		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005657.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	55	U	3	27.5	55	ug/Kg
11104-28-2	Aroclor-1221	55	U	9	27.5	55	ug/Kg
11141-16-5	Aroclor-1232	55	U	1.5	27.5	55	ug/Kg
53469-21-9	Aroclor-1242	55	U	7.2	27.5	55	ug/Kg
12672-29-6	Aroclor-1248	55	U	3.2	27.5	55	ug/Kg
11097-69-1	Aroclor-1254	55	U	3.7	27.5	55	ug/Kg
11096-82-5	Aroclor-1260	55	U	3.7	27.5	55	ug/Kg
37324-23-5	Aroclor-1262	55	U	16	27.5	55	ug/Kg
11100-14-4	Aroclor-1268	55	U	7.7	27.5	55	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	50.4		30 - 150		84%	SPK: 60
2051-24-3	Decachlorobiphenyl	90.9		30 - 150		76%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	27 Decanted:
Sample Wt/Vol:	30.08 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 7.09		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005658.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	45	U	2.5	22.5	45	ug/Kg
11104-28-2	Aroclor-1221	45	U	7.4	22.5	45	ug/Kg
11141-16-5	Aroclor-1232	45	U	1.2	22.5	45	ug/Kg
53469-21-9	Aroclor-1242	45	U	5.9	22.5	45	ug/Kg
12672-29-6	Aroclor-1248	45	U	2.6	22.5	45	ug/Kg
11097-69-1	Aroclor-1254	45	U	3	22.5	45	ug/Kg
11096-82-5	Aroclor-1260	45	U	3	22.5	45	ug/Kg
37324-23-5	Aroclor-1262	45	U	13	22.5	45	ug/Kg
11100-14-4	Aroclor-1268	45	U	6.3	22.5	45	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	48.3		30 - 150		81%	SPK: 60
2051-24-3	Decachlorobiphenyl	85.9		30 - 150		72%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	42 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 7.10		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005659.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	57	U	3.1	28.5	57	ug/Kg
11104-28-2	Aroclor-1221	57	U	9.3	28.5	57	ug/Kg
11141-16-5	Aroclor-1232	57	U	1.5	28.5	57	ug/Kg
53469-21-9	Aroclor-1242	57	U	7.4	28.5	57	ug/Kg
12672-29-6	Aroclor-1248	57	U	3.3	28.5	57	ug/Kg
11097-69-1	Aroclor-1254	57	U	3.8	28.5	57	ug/Kg
11096-82-5	Aroclor-1260	57	U	3.8	28.5	57	ug/Kg
37324-23-5	Aroclor-1262	57	U	17	28.5	57	ug/Kg
11100-14-4	Aroclor-1268	57	U	7.9	28.5	57	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	52.3		30 - 150		87%	SPK: 60
2051-24-3	Decachlorobiphenyl	94.9		30 - 150		79%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Analytical Method:	SOM01.2_PCB	% Moisture:	41 Decanted:
Sample Wt/Vol:	30.07 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	1
GPC Factor :	1.0 PH : 6.96		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB005660.D	1	05/28/13	05/29/13	PB70053

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	56	U	3	28	56	ug/Kg
11104-28-2	Aroclor-1221	56	U	9.1	28	56	ug/Kg
11141-16-5	Aroclor-1232	56	U	1.5	28	56	ug/Kg
53469-21-9	Aroclor-1242	56	U	7.3	28	56	ug/Kg
12672-29-6	Aroclor-1248	56	U	3.2	28	56	ug/Kg
11097-69-1	Aroclor-1254	56	U	3.7	28	56	ug/Kg
11096-82-5	Aroclor-1260	56	U	3.7	28	56	ug/Kg
37324-23-5	Aroclor-1262	56	U	17	28	56	ug/Kg
11100-14-4	Aroclor-1268	56	U	7.8	28	56	ug/Kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	48.6		30 - 150		81%	SPK: 60
2051-24-3	Decachlorobiphenyl	88.1		30 - 150		73%	SPK: 120

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-41(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	68

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	4	J	~~IN~~	1	0.22	3.35	6.7	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	24.4	J	~~*NE~~	1	0.32	0.55	1.1	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-42(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-02	Matrix:	SOIL
Level (low/med):	low	% Solid:	60.3

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	16.9	J	~~N~~	1	0.26	3.9	7.8	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	738	J	~~*NE~~	1	0.38	0.65	1.3	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-43(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-03	Matrix:	SOIL
Level (low/med):	low	% Solid:	72.6

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	7.3	J	~~N~~	1	0.2	2.95	5.9	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	549	J	~~*NE~~	1	0.29	0.495	0.99	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	HRDD-44(0.5-1)	SDG No.:	E2374
Lab Sample ID:	E2374-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	58.3

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	28.3	J	~~N~~	1	0.28	4.15	8.3	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	697	J	~~*NE~~	1	0.4	0.7	1.4	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	DUP(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	58.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	30.2	J ~~N~~	1	0.26	3.9	7.8	mg/kg	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	932	J ~~*NE~~	1	0.38	0.65	1.3	mg/kg	05/28/13	05/28/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	05/22/13
Project:	ARC Sayreville PostEx	Date Received:	05/23/13
Client Sample ID:	FB(052213)	SDG No.:	E2374
Lab Sample ID:	E2374-06	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	60	U	1	2.4	30	60	ug/L	05/28/13	05/28/13	ISM01.3
7440-38-2	Arsenic	10	U	1	2.7	5	10	ug/L	05/28/13	05/28/13	ISM01.3

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2572
QUOTE NO.
COC Number 029321

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Arcadis
ADDRESS: 105 Fieldcrest Ave Suite 203
CITY: Edison STATE: NJ ZIP: 08837
ATTENTION: Moh Mohiddiens
PHONE: 732-661-3800 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Resources Corp
PROJECT NO.: NJ5514.7 LOCATION: Sayreville
PROJECT MANAGER: Moh Mohiddiens
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: Arcadis PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

	1	2	3	4	5	6	7	8	9
TCLP Metals	X								

PRESERVATIVES

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	TCLP Metals 1	2	3	4	5	6	7	8	9	COMMENTS
1.	HRDD-41 (2-2.5)	Soil		X	6/14/13	8:20	1	X									
2.	HRDD-41 (3.5-4)	Soil		X	6/14/13	8:25	1	X									
3.	HRDD-42 (2-2.5)	Soil		X	6/14/13	8:45	1	X									
4.	HRDD-42 (3.5-4)	Soil		X	6/14/13	8:50	1	X									
5.	HRDD-43 (2-2.5)	Soil		X	6/14/13	9:10	1	X									
6.	HRDD-43 (3.5-4)	Soil		X	6/14/13	9:15	1	X									
7.	HRDD-44 (2-2.5)	Soil		X	6/14/13	9:25	1	X									
8.	HRDD-44 (3.5-4)	Soil		X	6/14/13	9:30	1	X									
9.	DUP (061413)	Soil		X	6/14/13	—	1	X									
10, 11	EB (061413) / FB (061413)	AQ		X	6/14/13	9:50/10:50	1	X									

COMMENTS: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	6/14/13	1. [signature]
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. [signature]	1405 6-14-13	3. [signature]

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°
Ice in Cooler?: yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

Reginald and Chris,

Please note that there were some errors on this Chain of Custody:

1. Lines 2, 4, 6, and 8 (3.5-4 intervals of samples) should be placed on **HOLD**

2. Lines 1, 3, 5, 7, 9 and 10 should be requested 3-day TAT

3. The analysis requested is not correct. It should be TAL metals (CLP method), and only report antimony and arsenic.

Please confirm these modifications to the COC by replying to this email.

Thanks,

-Jay

Jason B. Flagg, EIT, CHMM | Staff Environmental Specialist |
jason.flagg@arcadis-us.com

ARCADIS U.S., Inc. | 105 Fieldcrest Ave., Suite 203 | Edison, NJ 08844

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ARCADIS, Imagine the result

Please consider the environment before printing this email.

arc_125_small

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-41(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	73.8

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.1	J	~~JN~~	1	0.21	3.1	6.2	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	9	J	~~N~~	1	0.3	0.5	1	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-42(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-03	Matrix:	SOIL
Level (low/med):	low	% Solid:	55.8

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	22.3	J	~~N~~	1	0.25	3.8	7.6	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	467	J	~~N~~	1	0.37	0.65	1.3	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
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* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-42(3.5-4)	SDG No.:	E2572
Lab Sample ID:	E2572-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	71.3

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	7.2	J	~~N~~	1	0.2	2.95	5.9	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	184	J	~~N~~	1	0.28	0.49	0.98	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-43(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	57.2

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	15.9	J	~~N~~	1	0.25	3.75	7.5	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	368	J	~~N~~	1	0.36	0.6	1.2	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-43(3.5-4)	SDG No.:	E2572
Lab Sample ID:	E2572-06	Matrix:	SOIL
Level (low/med):	low	% Solid:	57.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	29.3	J ~~N~~	1	0.25	3.8	7.6	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	1680 DJ ~~1660~~	~~ORN~~	1	0.37	0.635	1.27	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-43(3.5-4)DL	SDG No.:	E2572
Lab Sample ID:	E2572-06DL	Matrix:	SOIL
Level (low/med):	low	% Solid:	57.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	1680	ND	25	9.2	15.85	31.7	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-44(2-2.5)	SDG No.:	E2572
Lab Sample ID:	E2572-07	Matrix:	SOIL
Level (low/med):	low	% Solid:	55.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	19.2	J ~~N~~	1	0.27	4.05	8.1	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	402	J ~~N~~	1	0.39	0.7	1.4	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	HRDD-44(3.5-4)	SDG No.:	E2572
Lab Sample ID:	E2572-08	Matrix:	SOIL
Level (low/med):	low	% Solid:	77.5

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.1 J	~~JN~~	1	0.19	2.8	5.6	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	21.8 J	~~N~~	1	0.27	0.47	0.94	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	DUP(061413)	SDG No.:	E2572
Lab Sample ID:	E2572-09	Matrix:	SOIL
Level (low/med):	low	% Solid:	72.8

Cas	Parameter	Conc.		Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.2	J	~~N~~	1	0.2	3.05	6.1	mg/kg	06/17/13	06/19/13	ISM01.3
7440-38-2	Arsenic	13.8	J	~~N~~	1	0.29	0.5	1	mg/kg	06/17/13	06/19/13	ISM01.3

Color Before:	Gray	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	EB(061413)	SDG No.:	E2572
Lab Sample ID:	E2572-10	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	60	U	1	2.4	30	60	ug/L	06/18/13	06/19/13	ISM01.3
7440-38-2	Arsenic	10	U	1	2.7	5	10	ug/L	06/18/13	06/19/13	ISM01.3

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/14/13
Project:	ARC Sayreville PostEx	Date Received:	06/14/13
Client Sample ID:	FB(061413)	SDG No.:	E2572
Lab Sample ID:	E2572-11	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	60	U	1	2.4	30	60	ug/L	06/18/13	06/19/13	ISM01.3
7440-38-2	Arsenic	10	U	1	2.7	5	10	ug/L	06/18/13	06/19/13	ISM01.3

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Metals Analysis

SDG#E2733

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #21725R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # E2733 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB	PEST	MET
E2733	HRDD-42(5.5-6.0)	E2733-04	Soil	6/27/2013						X
	HRDD-43(5.5-6.0)	E2733-05	Soil	6/27/2013						X
	HRDD-44(5.5-6.0)	E2733-06	Soil	6/27/2013						X

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	

QA - Quality Assurance

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery
HRDD-42(5.5-6.0)	Antimony	50%

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

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

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within 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 VALIDATION CHECKLIST FOR METAL

METALS/HG/CN; ILM05.4	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution		X	X		
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: May 23, 2014

PEER REVIEW: Dennis Capria

DATE: June 4, 2014

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2733
QUOTE NO.
COC Number 029653

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: ARCADIS
ADDRESS: 105 Fieldcrest Ave, Suite 203
CITY: Edison STATE: NJ ZIP: 08837
ATTENTION: Moh Mohiuddin
PHONE: 732-661-3800 FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Atlantic Resources Corporation
PROJECT NO.: NJ 574.7 LOCATION: Sayreville
PROJECT MANAGER: Moh Mohiuddin
e-mail:
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: ARCADIS PO#:
ADDRESS:
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: Standard DAYS *
HARD COPY: Standard DAYS *
EDD: Standard DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☒ LEVEL 4: Results + QC (all raw data)
☐ EDD Format:

ANALYSIS

PCB's, Total VOC, TCL Metals

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	~~ARC-114 (4-8)~~	~~Soil~~	~~X~~		~~6/27/13~~			~~X~~									
2. 1	ARC-115 (4-8)	Soil	X		6/27/13	9:30	3	X									
3.	~~ARC-116 (4-8)~~	~~Soil~~	~~X~~		~~6/27/13~~			~~X~~									
4. 2	ARC-117 (4-8)	Soil	X		6/27/13	830	3	X									
5.	~~ARC-118 (4-8)~~	~~Soil~~	~~X~~		~~6/27/13~~			~~X~~									
6. 3	PWC-60 (12-14)	Soil	X		6/27/13	11:30	3		X								
7. 4	HRDD-42 (5.5-6.0)	Soil	X		6/27/13	10:45	1	1		X							Hold
8. 5	HRDD-43 (5.5-6.0)	Soil	X		6/27/13	11:00	1	1		X							Hold
9. 6	HRDD-44 (5.5-6.0)	Soil	X		6/27/13	11:10	1			X							Hold
10.																	

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	6/27/13 1515	1. [signature]
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. [signature]	6-27-13 1750	3. [signature]

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°
Ice in Cooler?: Yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	HRDD-42(5.5-6.0)	SDG No.:	E2733
Lab Sample ID:	E2733-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	82.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	1.5 J	~~JN~~	1	0.18	2.7	5.4	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	5.5		1	0.26	0.445	0.89	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	HRDD-43(5.5-6.0)	SDG No.:	E2733
Lab Sample ID:	E2733-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	79.2

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	0.52	J ~~JN~~	1	0.18	2.75	5.5	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	5.7		1	0.27	0.46	0.92	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Arcadis	Date Collected:	06/27/13
Project:	ARC Sayreville PostEx	Date Received:	06/27/13
Client Sample ID:	HRDD-44(5.5-6.0)	SDG No.:	E2733
Lab Sample ID:	E2733-06	Matrix:	SOIL
Level (low/med):	low	% Solid:	79.5

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-36-0	Antimony	5.3	UJ ~~UN~~	1	0.18	2.65	5.3	mg/kg	07/01/13	07/01/13	ISM01.3
7440-38-2	Arsenic	3.6		1	0.26	0.445	0.89	mg/kg	07/01/13	07/01/13	ISM01.3

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	Metals Group3				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB Metals, and Miscellaneous Analyses

SDG#200-17642

Analyses Performed By:
TestAmerica Laboratories
Burlington, Vermont

Report: #21739R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #200-17642 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB/ PEST	MET	MISC
200-17642	TS003 (072413)	200-17642-2	Soil	7/24/2013		X	X	X	X	X
	TS004 (072413)	200-17642-3	Soil	7/24/2013		X	X	X	X	X
	TB (072413)	200-17642-4	Water	7/24/2013		X				

Note:

1. Miscellaneous analyses include Extractable Petroleum Hydrocarbon (EPH) and Total Cyanide.

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods SOM01.2_VOC, SVOC, PEST, and PCB, as well as the NJ DEP EPH method. Data were reviewed in accordance with the method specified criteria and USEPA National Functional Guidelines of June 2008.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

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.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM01.2	Water	14 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	14 days from collection to analysis	Cool to <6°C; preserved with sodium bisulfate

s.u. Standard units

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, trip, 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. Trip blanks measure contamination of samples during shipment. Rinse blanks measure contamination of samples during field operations.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with the following sample locations were qualified.

Sample Locations	Compounds	Blank Result	Sample Result	Qualification
TS003 (072413) TS004 (072413)	Methylene chloride Toluene 1,2,3-Trichlorobenzene	<RL[1]	Detected sample results <RL	UB at the RL
	Unknown TIC (R.T. 10.51)	Detected	Detected	R

Notes
RL = reporting limit is equal to the low point of the initial calibration curve.
1 = two times the RL for methylene chloride, 2-butanone and acetone.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 15 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and a RRF value greater than control limit (0.05). All compounds listed in Table 15 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 15 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and a RRF value greater than control limit (0.05). All target compounds associated with the closing continuing calibration standard must exhibit a percent difference (%D) less than the control limit (50%) and RRF value greater than control limit (0.01).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
TS003 (072413) TS004 (072413)	ICAL RRF	1,4-Dioxane	0.004
TB (072413)	ICAL RRF	1,4-Dioxane	0.003

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Opening/Closing	Criteria	Sample Result	Qualification
Initial Calibration	NA	RRF <0.05/<0.01[1]	Non-detect	R
			Detect	J
Continuing Calibration	Opening	RRF <0.05/<0.01[1]	Non-detect	R
			Detect	J
	Closing	RRF <0.01	Non-detect	R
			Detect	J
Initial Calibration	NA	%RSD > 20/40[1]%	Non-detect	UJ
			Detect	J
Continuing Calibration	Opening	%D >25/40[1]%	Non-detect	UJ
			Detect	J
	Closing	%D >50%	Non-detect	UJ
			Detect	J

1. Target compounds listed in Table 3 of the SOM NFG.
2. Minimum RRF for 1,4-dioxane and 1,4-dixoane-d8 is 0.005.
3. Note: The compound 1,4-Dioxane exhibited calibration an RRF value <0.005. However, upon further review of the calibration standard area counts and chromatographs it was determined that if the compound was present in the associated field samples, the compound would have been reported as

detected. Therefore the associated sample results have been qualified as estimated and not rejected based on professional judgment.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
TS003 (072413)	Vinyl Chloride-d3	AC
	Chloroethane-d5	AC
	1,1-Dichloroethene-d2	AC
	2-Butanone-d5	AC
	Chloroform-d	AC
	1,2-Dichloroethane-d4	AC
	Benzene-d6	> UL
	1,2-Dichloropropane-d6	AC
	Toluene-d8	AC
	trans-1,3-Dichloropropene-d4	AC
	2-Hexanone-d5	AC
	1,4-Dioxane-d8	AC
	1,1,2,2-Tetrachloroethane-d2	AC
	1,2-Dichlorobenzene-d4	AC

Diluted (D)
Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 21 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL) but > 20%	Non-detect	UJ
	Detect	J
< 20%	Non-detect	R
	Detect	J

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
TS003 (072413)	Chlorobenzene-d5	AC
	1,4-Difluorobenzene	AC
	1,4-Dichlorobenzene-d4	44.7%

Acceptable (AC)

The criteria used to evaluate the internal standard responses are presented in the following table. In the case of an internal standard deviation, the compounds quantitated under the deviant internal standard are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> 200%	Non-detect	No action
	Detect	J
< 50%	Non-detect	R
	Detect	J

The reanalysis of sample TS003 (072413) exhibited similar internal standard recovery. The usable data from the initial analysis will be reported.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not

qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment/Storage blanks		X		X	
C. Trip blanks		X		X	
Laboratory Control Sample (LCS)					X
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
DMC Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs/RRFs		X	X		
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X	X		
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

VOCs: SOM01.2 VOC	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					

%RSD Relative standard deviation %R Percent recovery
RPD Relative percent difference %D Percent difference

SEMI-VOLATILE VOLATILE ORGANIC COMPOUND (SVOC) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 1.2 SVOC	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction 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.

All compounds associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the compounds listed in the following table. Sample results associated with the following sample locations were qualified.

Sample Locations	Compounds	Blank Result	Sample Result	Qualification
TS003 (072413)	Di-n-butylphthalate	<RL[1]	Detected sample results <RL	UB at the RL
	Bis(2-ethylhexyl)phthalate	>RL[1]	Detected sample results >RL and < blank concentration	UB at detected sample concentration
TS004 (072413)	Di-n-butylphthalate Butylbenzylphthalate	<RL[1]	Detected sample results <RL	UB at the RL
	Bis(2-ethylhexyl)phthalate	>RL[1]	Detected sample results >RL and < blank concentration	UB at detected sample concentration

Notes
RL = reporting limit is equal to the low point of the initial calibration curve.
1 = five times the RL for bis(2-ethylhexyl)phthalate.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds not listed in Table 28 of the SOM NFG (National Functional Guidelines) associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) and an RRF value greater than control limit (0.05). All compounds listed in Table 28 of the SOM NFG associated with the initial calibration standards must exhibit a %RSD less than the control limit (40%) and an RRF value greater than control limit (0.01).

4.2 Continuing Calibration

All target compounds not listed in Table 28 of the SOM NFG associated with the opening continuing calibration standard must exhibit a percent difference (%D) less then the control limit (25%) and RRF value greater than control limit (0.05). All target compounds not listed associated with the closing continuing calibration standard must exhibit a percent difference (%D) less then the control limit (50%) and RRF value greater than control limit (0.01).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the method specified acceptance limits. Only the surrogates that are associated with the analyzed compound list were evaluated.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	Recovery
TS004 (072413)	Phenol-d5	AC
	Bis(2-chloroethyl)ether-d8	AC
	2-Chlorophenol-d4	AC
	4-Methylphenol-d8	> UL
	Nitrobenzene-d5	AC
	2-Nitrophenol-d4	AC
	2,4-Dichlorophenol-d3	AC
	4-Chloroaniline-d4	AC
	Dimethylphthalate-d6	AC
	Acenapthylene-d8	AC
	4-Nitrophenol-d4	AC

Sample Locations	Surrogate	Recovery
	Fluorene-d10	AC
	4,6-Dinitro-2-methylphenol-d2	AC
	Anthracene-d10	AC
	Pyrene-d10	AC
	Benzo(a)pyrene-d12	AC

Acceptable (AC)

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant surrogate (listed in Table 34 of the SOM NFG) are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> upper control limit (UL)	Non-detect	No Action
	Detect	J
< lower control limit (LL)	Non-detect	UJ or R
	Detect	J
Surrogates diluted below the calibration curve due to the high concentration of a target compounds	Non-detect	No Action
	Detect	

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC to exhibit area counts that are not greater than two times (+200%) or less than one-half (-50%) the area counts of the associated continuing calibration standard. Only the internal standards that are associated with the analyzed compound list were evaluated.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
TS003 (072413)	1,4-Dichlorobenzene-d4	AC
	Naphthalene-d8	>200%
	Acenaphthene-d10	>200%
	Phenanthrene-d10	AC
	Chrysene-d12	AC
	Perylene-d12	AC
TS004 (072413)	1,4-Dichlorobenzene-d4	>200%
	Naphthalene-d8	>200%
	Acenaphthene-d10	>200%
	Phenanthrene-d10	AC
	Chrysene-d12	AC
	Perylene-d12	AC

The criteria used to evaluate the internal standard responses are presented in the following table. In the case of an internal standard deviation, the compounds quantitated under the deviant internal standard are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No action
	Detect	J
< the lower control limit (LL) but > 20%	Non-detect	UJ
	Detect	J
< 20%	Non-detect	R
	Detect	J

Reanalysis of the samples showed similar internal standard recoveries. The primary analyses will be reported.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compounds concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

8. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

LCS is not required for SOM volatile analysis and was not performed by the laboratory. The data was not qualified.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate(MSD) %R					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
Surrogate Spike Recoveries		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X	X		
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD Relative standard deviation
%R Percent recovery
RPD Relative percent difference
%D Percent difference

PESTICIDES ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

All analytes associated with the QA blanks exhibited a concentration less than the MDL, with the exception of the analytes listed in the following table. Sample results associated with the following sample locations were qualified.

Sample Locations	Compounds	Blank Result	Sample Result	Qualification
TS003 (072413)	Heptachlor Endosulfan II	<RL	Detected sample results <RL	UB at the RL
TS004 (072413)	Heptachlor			

RL = reporting limit

3. System Performance

The instrument performance checks are performed to ensure adequate resolution and instrument sensitivity.

3.1 Resolution Check Mixture

The resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 80% for all analytes on the primary column and greater than or equal to 50% for the confirmation column when one Individual Standard Mixture (C) is used. If two Individual Standard Mixtures (A and B) are used, the resolution between two adjacent peaks in the Resolution Check Mixture must be greater than or equal to 60%.

3.2 Performance Evaluation Mixture (PEM)

The resolution between any two adjacent peaks in the Performance Evaluation Mixture (PEM) must be greater than or equal to 90% on each column. In addition, the percent breakdown of 4,4'-DDT and Endrin in the PEMs must each be less than or equal to 20% for each column and the combined percent breakdown must be less than or equal to 30% on each column.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The maximum RSD allowed is 20% for all target compounds with the exception of 25% for alpha-BHC and delta-BHC and 30% for toxaphene.

4.2 Continuing Calibration

All target compounds associated with the Performance Evaluation Mixture (PEM) must exhibit a percent difference (%D) less than the control limit (25%). All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) for the calibration factor less than the control limit (20%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. Pesticides analysis requires the two pesticides surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit a RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Florisil Cartridge Performance Check

The performance of each lot of Florisil cartridges used for sample cleanup must be checked at least once, or every six months. The performance check is acceptable if the recovery of the target pesticide compounds and surrogates in the Individual Standard Mixture (A) are 80 to 120% and the recovery limit for 2,4,5-trichlorophenol is less than 5%.

The performance check recoveries were within acceptable limits.

9. Gel Permeation Chromatography Performance Analysis

The GPC check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the recoveries of the pesticides in the GPC continuing calibration verification solution are within 80 to 110%.

The GPC calibration recoveries were within acceptable limits.

10. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

11. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must less than 25%.

Sample locations associated with %D analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	%D
TS003 (072413)	alpha-BHC	263.4%
	Heptachlor	34.4%
	Heptachlor epoxide	81.9%
	Endosulfan I	212.2%
	Endosulfan II	68.4%
	Endosulfan sulfate	64.0%
	Endrin aldehyde	639.0%
TS004 (072413)	delta-BHC	123.7%
	Heptachlor	448.3%
	Heptachlor epoxide	193.2%

Sample Locations	Compound	%D
	Endosulfan I	427.8%
	Dieldrin	27.0%
	Endosulfan sulfate	999.9%
	Endrin aldehyde	95.7%
	alpha-Chlordane	60.5%
	gamma-Chlordane	226.0%

The criteria used to evaluate the %D are presented in the following table. In the case of a %D deviation, the sample results are qualified as documented in the table below.

Control limit (%D)	Qualification
Sample results >RL and %D >25% to 50%	J
Sample results >RL and %D >50% to 100%	JN
Sample results >RL and %D >100% [1]	R
Sample results >RL and %D >100% to 200% (Interference detected)[2]	J or JN
Sample results <RL and %D >50%	U

When the pesticide sample result is less than the RL and the %D greater than 50%, the sample result is raised to the RL and reported as nondetect.

Note 1: If the peak is confirmed, sample results will be qualified as estimated (J). If peak exhibits interference or if the pesticide cannot be positively determined due to weathering, the sample results will be qualified as tentative identification estimate (JN).

Note 2: If interference is detected in either column the sample results will be qualified as tentative identification estimate (JN).

12. 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 VALIDATION CHECKLIST FOR PESTICIDES

SVOCs: SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X	X		
B. Equipment blanks					X
Laboratory Control Sample (LCS)		X		X	
Laboratory Control Sample Duplicate(LCSD)		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS)					X
Matrix Spike Duplicate(MSD)					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Column %D $\leq$ 25%		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/confirmation		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference.

POLYCHLORINATED BIPHENYLS (PCBs) ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
CLP SOM 01.2	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance 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.

No compounds were detected in the associated blanks.

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% for each peak is allowed. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All peaks associated with the opening continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%). The closing continuing calibration standard must exhibit a %D less than the control limit (50%)

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires the surrogate compounds must exhibited recoveries within the method established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the method established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the method established acceptance limits.

> Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound's concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not analyzed on a sample within this data set.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the method established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Gel Permeation Chromatography Performance Analysis

The GPC calibration check is used to verify the performance of the GPC during sample clean-up. GPC calibration is acceptable if the resolution of the phthalate and methoxychlor peaks in the GPC calibration mixture are greater than 85% and the perylene and sulfur peaks greater than 90% baseline resolution.

The GPC calibration resolution is acceptable.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

10. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the percent difference (%D) of detected sample results must be less than 25%.

Sample locations associated with %D analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	%D
TS003 (072413)	Aroclor 1254	48.0%

The criteria used to evaluate the %D are presented in the following table. In the case of a %D deviation, the sample results are qualified as documented in the table below.

Control limit (%D)	Qualification
Sample results >RL and %D >25% to 50%	J
Sample results >RL and %D >50% to 100%	JN
Sample results >RL and %D >100% [1]	R
Sample results >RL and %D >100% to 200% (Interference detected)[2]	J or JN
Sample results <RL and %D >50%	U

When the pesticide sample result is less than the RL and the %D greater than 50%, the sample result is raised to the RL and reported as nondetect.

Note 1: If the peak is confirmed, sample results will be qualified as estimated (J). If peak exhibits interference or if the pesticide cannot be positively determined due to weathering, the sample results will be qualified as tentative identification estimate (JN).

Note 2: If interference is detected in either column the sample results will be qualified as tentative identification estimate (JN).

11. 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 VALIDATION CHECKLIST FOR PCBs

PCBs; SOM 01.2	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					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
Matrix Spike Duplicate(MSD) %R					X
MS/MSD Precision (RPD)					X
Field Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Column (%D)		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present				X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

EXTRACTABLE PETROLEUM HYDROCARBON ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
EPH by Method NJ DEP	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C.
	Water	14 days from collection to extraction and 40 days from extraction 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

A maximum RSD of 20% or a correlation coefficient of greater than 0.99 is allowed. VPH-EPH 25%

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%). VPH-EPH 25%

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. The analysis requires surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD was not performed on a sample within this data set.

7. 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 compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

9. Compound Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows.

All identified compounds met the specified criteria.

10. 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 VALIDATION CHECKLIST FOR EPH

NJ DEP EPH	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/FID)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate(MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)					X
Surrogate Spike Recoveries		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Pattern identification		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

%RSD – relative standard deviation, %R - percent recovery, RPD - relative percent difference, %D – difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Methods ISM01.3 for metals and cyanide. Data were reviewed in accordance with USEPA National Functional Guidelines of January 2010.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- 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.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected.

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.

METALS ANALYSES

1. Holding Times

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

Method	Matrix	Holding Time	Preservation
ISM01.3 (Metals and cyanide)	Water	180 days from collection to analysis	Cool to <6°C; preserved to a pH of less than 2.
	Soil	180 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 (common laboratory contaminant compounds are calculated at ten times) 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 detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (J). No other qualification of the sample results was required.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration and Continuing Calibration

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within control limits.

All initial and continuing calibration verification standard recoveries were within the control limit.

3.2 CRDL Check Standard

The CRDL check standard serves to verify the linearity of calibration of the analysis at the CRDL. The CRDL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the CRDL standard analysis are presented below in the CRDL standards evaluation table.

A CRDL check standard is not required for ISM01.3 ICP/MS analysis.

3.3 ICP Interference Control Sample (ICS)

The ICS verifies the laboratories interelement and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

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

4.1 MS Analysis

All metal analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

All analytes associated with MS recoveries were within control limits with the exception of the following analytes present in the table below.

Sample Location	Analytes	MS Recovery
TS004 (072413)	Antimony	31%
	Selenium	73%

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

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

4.2 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 CRDL. 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 5 times the CRDL, a control limit of one times the CRDL is applied for water matrices and two times the CRDL for soil matrices.

The laboratory duplicate was not analyzed on a sample within this data set.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the precision and accuracy of the field sampling procedures and analytical method. A control limit of 75% 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 was not analyzed on a sample within this data set.

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. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

All serial dilutions were within control limits, with the exception of the analytes presented in the following table. The sample locations associated with the deviant %D are also presented in the following table.

Sample Locations	Analytes	Serial Dilution (%D)
TS004 (072413)	Aluminum	17%
	Barium	30%
	Calcium	19%
	Chromium	18%
	Cobalt	18%
	Iron	18%
	Magnesium	20%
	Manganese	17%
	Potassium	18%
	Vanadium	15%
	Zinc	17%

The criteria used to evaluate the serial dilution are presented in the following table. In the case of a serial dilution deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

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 VALIDATION CHECKLIST FOR METAL

METALS/HG/CN; ISM01.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV) Colorimetric Spectroscopy					
Tier II Validation					
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
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Lab Duplicate (RPD)		X		X	
ICP Serial Dilution		X	X		
Reporting Limit Verification		X		X	
Raw Data		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
CRDL Standard					X
ICP Interference Check		X		X	
Transcription/calculation errors present				X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: May 28, 2014

PEER REVIEW: Dennis Capria

DATE: June 4, 2014

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

777 New Durham Road
Edison, New Jersey 08817
Phone: (732) 549-3900 Fax: (732) 549-3679

Ccc #1

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CHAIN OF CUSTODY / ANALYSIS REQUEST

Page 1 of 1

Name (for report and invoice) Kaiti Lino	Samplers Name (Printed) Tom Quinn	Site/Project Identification ARC HRDD Sites
Company ARCADIS-US	P. O. # NJ 000514.0007	State (Location of site): NJ: ☐ NY: ☐ Other:
Address 105 Fieldcrest Ave	Analysis Turnaround Time: Standard ☑	Regulatory Program:
City Edison State NJ	Rush Chrages Authorized For: 2 Week ☐ 1 Week ☐ Other ☐	LAB USE ONLY Project No:
Phone 267 685 Fax 1822		Job No:

ANALYSIS REQUESTED (ENTER "X" BELOW TO INDICATE REQUEST)

Sample Identification	Date	Time	Matrix	No. of. Cont.	TCL VOCs	TCL SVOC	TCL Pesticides	TCL PCBs	TAL Metals	EPH	Hexavalent Chromium					Sample Numbers
TS002(072413)	7/24/13	1200	Soil	8	X	X	X	X	X	X	Hold					-1
TS003(072413)	7/24/13	1330	Soil	8	X	X	X	X	X	X	Hold					-2
TS004(072413)	7/24/13	1430	Soil	8	X	X	X	X	X	X	Hold					-3
TB(072413)	7/24/13	0700	Water	2	X											-4

200-17642 COC

Preservation Used: 1 = ICE, 2 = HCl, 3 = H_2SO_4, 4 = HNO_3, 5 = NaOH
6 = Other _____, 7 = Other _____

Soil:
Water:

Special Instructions TAL/TCL by ILM/SOM Methods

Water Metals Filtered (Yes/No)? _____

Relinquished by	Company	Date / Time	Received by	Company
[signature]	ARCADIS	7/24/13 1555	1) [signature]	[signature]
2) [signature]	[signature]	7/24 1640	2) [signature]	TA
3) [signature]	Test America	7/24/13 1630	3) [signature] 7/24/13 0810	TABUR
4)			4)	

Laboratory Certifications: New Jersey (12028), New York (11452), Pennsylvania (68-522), Connecticut (PH-0200), Rhode Island (132). TAL - 0016 (0408)

Massachusetts (M-NJ312), North Carolina (No. 578)

TRAS, 4.2/4.4 NCS

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-17642-4

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: NHYW06.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. Date Analyzed: 07/31/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	0.20	J B
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	0.44	J B
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	5.0	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	100	U J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-17642-4

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: NHYW06.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. Date Analyzed: 07/31/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	0.29	J B
108-87-2	Methylcyclohexane	5.0	U
78-87-5	1,2-Dichloropropane	5.0	U
75-27-4	Bromodichloromethane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-Xylene	5.0	U
179601-23-1	m,p-Xylene	5.0	U
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	0.24	J B
87-61-6	1,2,3-Trichlorobenzene	0.28	J B

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Water Lab Sample ID: 200-17642-4

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: NHYW06.D

Level: (TRACE or LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. Date Analyzed: 07/31/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:(ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		Unknown	10.45	76	B X J
02	E966796 [1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 5.69 (g/mL) g Lab File ID: NIDA07.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 18 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 10.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-71-8	Dichlorodifluoromethane	5.4	U
74-87-3	Chloromethane	5.4	U
75-01-4	Vinyl chloride	5.4	U
74-83-9	Bromomethane	5.4	U
75-00-3	Chloroethane	5.4	U
75-69-4	Trichlorofluoromethane	5.4	U
75-35-4	1,1-Dichloroethene	5.4	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.4	U
67-64-1	Acetone	2.5	J
75-15-0	Carbon disulfide	5.4	U
79-20-9	Methyl acetate	5.4	U
75-09-2	Methylene chloride	5.4 ~~2.8~~	~~J B~~ UB
156-60-5	trans-1,2-Dichloroethene	5.4	U
1634-04-4	Methyl tert-butyl ether	5.4	U
75-34-3	1,1-Dichloroethane	5.4	U
156-59-2	cis-1,2-Dichloroethene	5.4	U
78-93-3	2-Butanone	11	U
74-97-5	Bromochloromethane	5.4	U
67-66-3	Chloroform	5.4	U
71-55-6	1,1,1-Trichloroethane	5.4	U
110-82-7	Cyclohexane	5.4	U
56-23-5	Carbon tetrachloride	5.4	U
71-43-2	Benzene	5.4	U
107-06-2	1,2-Dichloroethane	5.4	U
123-91-1	1,4-Dioxane	110	U J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 5.69 (g/mL) g Lab File ID: NIDA07.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 18 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 10.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
79-01-6	Trichloroethene	5.4	U	
108-87-2	Methylcyclohexane	5.4	U	
78-87-5	1,2-Dichloropropane	5.4	U	
75-27-4	Bromodichloromethane	5.4	U	
10061-01-5	cis-1,3-Dichloropropene	5.4	U	
108-10-1	4-Methyl-2-pentanone	11	U	
108-88-3	Toluene	5.4 ~~0.29~~	~~J B~~	UB
10061-02-6	trans-1,3-Dichloropropene	5.4	U	
79-00-5	1,1,2-Trichloroethane	5.4	U	
127-18-4	Tetrachloroethene	5.4	U	
591-78-6	2-Hexanone	11	U	
124-48-1	Dibromochloromethane	5.4	U	
106-93-4	1,2-Dibromoethane	5.4	U	
108-90-7	Chlorobenzene	5.4	U	
100-41-4	Ethylbenzene	5.4	U	
95-47-6	o-Xylene	5.4	U	
179601-23-1	m,p-Xylene	5.4	U	
100-42-5	Styrene	5.4	U	
75-25-2	Bromoform	R ~~5.4~~	~~U~~	
98-82-8	Isopropylbenzene	5.4	U	
79-34-5	1,1,2,2-Tetrachloroethane	5.4	U	
541-73-1	1,3-Dichlorobenzene	R ~~5.4~~	~~U~~	
106-46-7	1,4-Dichlorobenzene	R ~~5.4~~	~~U~~	
95-50-1	1,2-Dichlorobenzene	R ~~5.4~~	~~U~~	
96-12-8	1,2-Dibromo-3-chloropropane	R ~~5.4~~	~~U~~	
120-82-1	1,2,4-Trichlorobenzene	R ~~5.4~~	~~U~~	
87-61-6	1,2,3-Trichlorobenzene	5.4 ~~0.37~~	~~J B~~	UBJ

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 5.69 (g/mL) g Lab File ID: NIDA07.D

Level: (TRACE or LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 18 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg Purge Volume: 10.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		Unknown	8.84	5.5	J
02		Unknown	10.32	21	J
03		Unknown	~~10.51~~	~~83~~	~~B X J~~ R
04	E966796 [1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS003 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 5.86 (g/mL) g Lab File ID: NIDA10.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 18 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 10.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-71-8	Dichlorodifluoromethane	5.2	U
74-87-3	Chloromethane	5.2	U
75-01-4	Vinyl chloride	5.2	U
74-83-9	Bromomethane	5.2	U
75-00-3	Chloroethane	5.2	U
75-69-4	Trichlorofluoromethane	5.2	U
75-35-4	1,1-Dichloroethene	5.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.2	U
67-64-1	Acetone	3.0	J
75-15-0	Carbon disulfide	5.2	U
79-20-9	Methyl acetate	1.4	J
75-09-2	Methylene chloride	2.0	J B
156-60-5	trans-1,2-Dichloroethene	5.2	U
1634-04-4	Methyl tert-butyl ether	5.2	U
75-34-3	1,1-Dichloroethane	5.2	U
156-59-2	cis-1,2-Dichloroethene	5.2	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.2	U
67-66-3	Chloroform	5.2	U
71-55-6	1,1,1-Trichloroethane	5.2	U
110-82-7	Cyclohexane	5.2	U
56-23-5	Carbon tetrachloride	5.2	U
71-43-2	Benzene	5.2	U
107-06-2	1,2-Dichloroethane	5.2	U
123-91-1	1,4-Dioxane	100	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS003 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 5.86 (g/mL) g Lab File ID: NIDA10.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 18 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 10.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
79-01-6	Trichloroethene	5.2	U
108-87-2	Methylcyclohexane	5.2	U
78-87-5	1,2-Dichloropropane	5.2	U
75-27-4	Bromodichloromethane	5.2	U
10061-01-5	cis-1,3-Dichloropropene	5.2	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	0.31	J B
10061-02-6	trans-1,3-Dichloropropene	5.2	U
79-00-5	1,1,2-Trichloroethane	5.2	U
127-18-4	Tetrachloroethene	5.2	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.2	U
106-93-4	1,2-Dibromoethane	5.2	U
108-90-7	Chlorobenzene	5.2	U
100-41-4	Ethylbenzene	5.2	U
95-47-6	o-Xylene	5.2	U
179601-23-1	m,p-Xylene	5.2	U
100-42-5	Styrene	5.2	U
75-25-2	Bromoform	5.2	U
98-82-8	Isopropylbenzene	5.2	U
79-34-5	1,1,2,2-Tetrachloroethane	5.2	U
541-73-1	1,3-Dichlorobenzene	5.2	U
106-46-7	1,4-Dichlorobenzene	5.2	U
95-50-1	1,2-Dichlorobenzene	5.2	U
96-12-8	1,2-Dibromo-3-chloropropane	5.2	U
120-82-1	1,2,4-Trichlorobenzene	0.23	J
87-61-6	1,2,3-Trichlorobenzene	0.26	J B

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TS003 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 5.86 (g/mL) g Lab File ID: NIDA10.D

Level: (TRACE or LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 18 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg Purge Volume: 10.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		Unknown	10.34	22	J
02		Unknown	10.49	82	B X J
03	E966796 [1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 5.98 (g/mL) g Lab File ID: NIDA08.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 14 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 10.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
75-71-8	Dichlorodifluoromethane	4.9	U
74-87-3	Chloromethane	4.9	U
75-01-4	Vinyl chloride	4.9	U
74-83-9	Bromomethane	4.9	U
75-00-3	Chloroethane	4.9	U
75-69-4	Trichlorofluoromethane	4.9	U
75-35-4	1,1-Dichloroethene	4.9	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	4.9	U
67-64-1	Acetone	2.3	J
75-15-0	Carbon disulfide	0.27	J
79-20-9	Methyl acetate	4.9	U
75-09-2	Methylene chloride	4.9 ~~1.4~~	~~J B~~ UB
156-60-5	trans-1,2-Dichloroethene	4.9	U
1634-04-4	Methyl tert-butyl ether	4.9	U
75-34-3	1,1-Dichloroethane	4.9	U
156-59-2	cis-1,2-Dichloroethene	4.9	U
78-93-3	2-Butanone	9.8	U
74-97-5	Bromochloromethane	4.9	U
67-66-3	Chloroform	4.9	U
71-55-6	1,1,1-Trichloroethane	4.9	U
110-82-7	Cyclohexane	4.9	U
56-23-5	Carbon tetrachloride	4.9	U
71-43-2	Benzene	4.9	U
107-06-2	1,2-Dichloroethane	4.9	U
123-91-1	1,4-Dioxane	98	U J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 5.98 (g/mL) g Lab File ID: NIDA08.D

Level: (TRACE/LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 14 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 10.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
79-01-6	Trichloroethene	4.9	U	
108-87-2	Methylcyclohexane	4.9	U	
78-87-5	1,2-Dichloropropane	4.9	U	
75-27-4	Bromodichloromethane	4.9	U	
10061-01-5	cis-1,3-Dichloropropene	4.9	U	
108-10-1	4-Methyl-2-pentanone	9.8	U	
108-88-3	Toluene	4.9 ~~0.30~~	~~J B~~	UB
10061-02-6	trans-1,3-Dichloropropene	4.9	U	
79-00-5	1,1,2-Trichloroethane	4.9	U	
127-18-4	Tetrachloroethene	4.9	U	
591-78-6	2-Hexanone	9.8	U	
124-48-1	Dibromochloromethane	4.9	U	
106-93-4	1,2-Dibromoethane	4.9	U	
108-90-7	Chlorobenzene	4.9	U	
100-41-4	Ethylbenzene	4.9	U	
95-47-6	o-Xylene	4.9	U	
179601-23-1	m,p-Xylene	4.9	U	
100-42-5	Styrene	4.9	U	
75-25-2	Bromoform	4.9	U	
98-82-8	Isopropylbenzene	0.16	J	
79-34-5	1,1,2,2-Tetrachloroethane	4.9	U	
541-73-1	1,3-Dichlorobenzene	4.9	U	
106-46-7	1,4-Dichlorobenzene	4.9	U	
95-50-1	1,2-Dichlorobenzene	4.9	U	
96-12-8	1,2-Dibromo-3-chloropropane	4.9	U	
120-82-1	1,2,4-Trichlorobenzene	0.22	J	
87-61-6	1,2,3-Trichlorobenzene	4.9 ~~0.27~~	~~J B~~	UB

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 5.98 (g/mL) g Lab File ID: NIDA08.D

Level: (TRACE or LOW/MED) LOW Date Received: 07/24/2013

% Moisture: not dec. 14 Date Analyzed: 07/30/2013

GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg Purge Volume: 10.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		Unknown	10.33	18	J
02		Unknown	~~10.51~~	~~77~~	~~B X J~~ R
03	E966796 [1]	Total Alkanes	N/A		

[1] EPA-designated Registry Number.

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:
Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1
Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2
Sample wt/vol: 30.5 (g/mL) g Lab File ID: RLAAU14.D
Level: (LOW/MED) LOW Extraction: (Type) SONC
% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013
Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/21/2013
GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
100-52-7	Benzaldehyde	210	U
108-95-2	Phenol	210	U
111-44-4	Bis(2-chloroethyl)ether	210	U
95-57-8	2-Chlorophenol	210	U
95-48-7	2-Methylphenol	210	U
108-60-1	2,2'-Oxybis(1-chloropropane)	210	U
98-86-2	Acetophenone	210	U
106-44-5	4-Methylphenol	210	U
621-64-7	N-Nitroso-di-n-propylamine	210	U
67-72-1	Hexachloroethane	210	U
98-95-3	Nitrobenzene	210	U
78-59-1	Isophorone	210	U
88-75-5	2-Nitrophenol	210	U
105-67-9	2,4-Dimethylphenol	210	U
111-91-1	Bis(2-chloroethoxy)methane	210	U
120-83-2	2,4-Dichlorophenol	210	U
91-20-3	Naphthalene	210	U
106-47-8	4-Chloroaniline	210	U
87-68-3	Hexachlorobutadiene	210	U
105-60-2	Caprolactam	210	U
59-50-7	4-Chloro-3-methylphenol	210	U
91-57-6	2-Methylnaphthalene	210	U
77-47-4	Hexachlorocyclopentadiene	210	U
88-06-2	2,4,6-Trichlorophenol	210	U
95-95-4	2,4,5-Trichlorophenol	210	U
92-52-4	1,1'-Biphenyl	210	U
91-58-7	2-Chloronaphthalene	210	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethylphthalate	210	U
606-20-2	2,6-Dinitrotoluene	210	U
208-96-8	Acenaphthylene	210	U
99-09-2	3-Nitroaniline	400	U
83-32-9	Acenaphthene	210	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 30.5 (g/mL) g Lab File ID: RLAAU14.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013

Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/21/2013

GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
51-28-5	2,4-Dinitrophenol	400	U
100-02-7	4-Nitrophenol	400	U
132-64-9	Dibenzofuran	210	U
121-14-2	2,4-Dinitrotoluene	210	U
84-66-2	Diethylphthalate	210	U
86-73-7	Fluorene	210	U
7005-72-3	4-Chlorophenyl-phenylether	210	U
100-01-6	4-Nitroaniline	400	U
534-52-1	4,6-Dinitro-2-methylphenol	400	U
86-30-6	N-Nitrosodiphenylamin [1]	210	U
95-94-3	1,2,4,5-Tetrachlorobenzene	210	U
101-55-3	4-Bromophenyl-phenylether	210	U
118-74-1	Hexachlorobenzene	210	U
1912-24-9	Atrazine	210	U
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	55	J
120-12-7	Anthracene	8.6	J
86-74-8	Carbazole	210	U
84-74-2	Di-n-butylphthalate	210 ~~15~~	~~J B~~ UB
206-44-0	Fluoranthene	97	J
129-00-0	Pyrene	130	J
85-68-7	Butylbenzylphthalate	210	U
91-94-1	3,3'-Dichlorobenzidine	210	U
56-55-3	Benzo(a)anthracene	66	J
218-01-9	Chrysene	94	J
117-81-7	Bis(2-ethylhexyl)phthalate	210	~~B~~ UB
117-84-0	Di-n-octylphthalate	210	U
205-99-2	Benzo(b)fluoranthene	110	J
207-08-9	Benzo(k)fluoranthene	88	J
50-32-8	Benzo(a)pyrene	92	J
193-39-5	Indeno(1,2,3-cd)pyrene	49	J
53-70-3	Dibenzo(a,h)anthracene	210	U
191-24-2	Benzo(g,h,i)perylene	59	J
58-90-2	2,3,4,6-Tetrachlorophenol	210	U

[1] Cannot be separated from Diphenylamine

1K - FORM I SV-TIC
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 30.5 (g/mL) g Lab File ID: RLAAU14.D

Level: (TRACE or LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013

Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/21/2013

GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 1.0

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	E966796 [2]	Total Alkanes	N/A		

[2] EPA-designated Registry Number.

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:
Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1
Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2
Sample wt/vol: 30.5 (g/mL) g Lab File ID: RLAAX08.D
Level: (LOW/MED) LOW Extraction: (Type) SONC
% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013
Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/22/2013
GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
100-52-7	Benzaldehyde	210	U
108-95-2	Phenol	210	U
111-44-4	Bis(2-chloroethyl)ether	210	U
95-57-8	2-Chlorophenol	210	U
95-48-7	2-Methylphenol	210	U
108-60-1	2,2'-Oxybis(1-chloropropane)	210	U
98-86-2	Acetophenone	7.5	J
106-44-5	4-Methylphenol	210	U
621-64-7	N-Nitroso-di-n-propylamine	210	U
67-72-1	Hexachloroethane	210	U
98-95-3	Nitrobenzene	210	U
78-59-1	Isophorone	210	U
88-75-5	2-Nitrophenol	210	U
105-67-9	2,4-Dimethylphenol	210	U
111-91-1	Bis(2-chloroethoxy)methane	210	U
120-83-2	2,4-Dichlorophenol	210	U
91-20-3	Naphthalene	210	U
106-47-8	4-Chloroaniline	210	U
87-68-3	Hexachlorobutadiene	210	U
105-60-2	Caprolactam	81	J
59-50-7	4-Chloro-3-methylphenol	210	U
91-57-6	2-Methylnaphthalene	210	U
77-47-4	Hexachlorocyclopentadiene	210	U
88-06-2	2,4,6-Trichlorophenol	210	U
95-95-4	2,4,5-Trichlorophenol	210	U
92-52-4	1,1'-Biphenyl	210	U
91-58-7	2-Chloronaphthalene	210	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethylphthalate	210	U
606-20-2	2,6-Dinitrotoluene	210	U
208-96-8	Acenaphthylene	210	U
99-09-2	3-Nitroaniline	400	U
83-32-9	Acenaphthene	210	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:
Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1
Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2
Sample wt/vol: 30.5 (g/mL) g Lab File ID: RLAAX08.D
Level: (LOW/MED) LOW Extraction: (Type) SONC
% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013
Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/22/2013
GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
51-28-5	2,4-Dinitrophenol	400	U
100-02-7	4-Nitrophenol	400	U
132-64-9	Dibenzofuran	210	U
121-14-2	2,4-Dinitrotoluene	210	U
84-66-2	Diethylphthalate	210	U
86-73-7	Fluorene	210	U
7005-72-3	4-Chlorophenyl-phenylether	210	U
100-01-6	4-Nitroaniline	400	U
534-52-1	4,6-Dinitro-2-methylphenol	400	U
86-30-6	N-Nitrosodiphenylamin [1]	210	U
95-94-3	1,2,4,5-Tetrachlorobenzene	210	U
101-55-3	4-Bromophenyl-phenylether	210	U
118-74-1	Hexachlorobenzene	210	U
1912-24-9	Atrazine	210	U
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	58	J
120-12-7	Anthracene	11	J
86-74-8	Carbazole	210	U
84-74-2	Di-n-butylphthalate	19	J B
206-44-0	Fluoranthene	97	J
129-00-0	Pyrene	130	J
85-68-7	Butylbenzylphthalate	210	U
91-94-1	3,3'-Dichlorobenzidine	210	U
56-55-3	Benzo(a)anthracene	67	J
218-01-9	Chrysene	95	J
117-81-7	Bis(2-ethylhexyl)phthalate	220	B
117-84-0	Di-n-octylphthalate	210	U
205-99-2	Benzo(b)fluoranthene	120	J
207-08-9	Benzo(k)fluoranthene	120	J
50-32-8	Benzo(a)pyrene	90	J
193-39-5	Indeno(1,2,3-cd)pyrene	57	J
53-70-3	Dibenzo(a,h)anthracene	20	J
191-24-2	Benzo(g,h,i)perylene	62	J
58-90-2	2,3,4,6-Tetrachlorophenol	210	U

[1] Cannot be separated from Diphenylamine

1K - FORM I SV-TIC
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TS003 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 30.5 (g/mL) g Lab File ID: RLAAX08.D

Level: (TRACE or LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013

Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/22/2013

GPC Cleanup: (Y/N) Y pH: 7.2 Dilution Factor: 1.0

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	E966796 [2]	Total Alkanes	N/A		

[2] EPA-designated Registry Number.

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:
Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1
Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3
Sample wt/vol: 30.8 (g/mL) g Lab File ID: RLAAU15.D
Level: (LOW/MED) LOW Extraction: (Type) SONC
% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013
Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/21/2013
GPC Cleanup: (Y/N) Y pH: 7.7 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
100-52-7	Benzaldehyde	190	U
108-95-2	Phenol	190	U
111-44-4	Bis(2-chloroethyl)ether	190	U
95-57-8	2-Chlorophenol	190	U
95-48-7	2-Methylphenol	190	U
108-60-1	2,2'-Oxybis(1-chloropropane)	190	U
98-86-2	Acetophenone	130	J
106-44-5	4-Methylphenol	190	U
621-64-7	N-Nitroso-di-n-propylamine	190	U
67-72-1	Hexachloroethane	190	U
98-95-3	Nitrobenzene	190	U
78-59-1	Isophorone	190	U
88-75-5	2-Nitrophenol	190	U
105-67-9	2,4-Dimethylphenol	190	U
111-91-1	Bis(2-chloroethoxy)methane	190	U
120-83-2	2,4-Dichlorophenol	190	U
91-20-3	Naphthalene	3.5	J
106-47-8	4-Chloroaniline	190	U
87-68-3	Hexachlorobutadiene	190	U
105-60-2	Caprolactam	190	U
59-50-7	4-Chloro-3-methylphenol	190	U
91-57-6	2-Methylnaphthalene	190	U
77-47-4	Hexachlorocyclopentadiene	190	U
88-06-2	2,4,6-Trichlorophenol	190	U
95-95-4	2,4,5-Trichlorophenol	190	U
92-52-4	1,1'-Biphenyl	190	U
91-58-7	2-Chloronaphthalene	190	U
88-74-4	2-Nitroaniline	380	U
131-11-3	Dimethylphthalate	190	U
606-20-2	2,6-Dinitrotoluene	190	U
208-96-8	Acenaphthylene	190	U
99-09-2	3-Nitroaniline	380	U
83-32-9	Acenaphthene	190	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 30.8 (g/mL) g Lab File ID: RLAAU15.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013

Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/21/2013

GPC Cleanup: (Y/N) Y pH: 7.7 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
51-28-5	2,4-Dinitrophenol	380	U	
100-02-7	4-Nitrophenol	380	U	
132-64-9	Dibenzofuran	190	U	
121-14-2	2,4-Dinitrotoluene	190	U	
84-66-2	Diethylphthalate	190	U	
86-73-7	Fluorene	190	U	
7005-72-3	4-Chlorophenyl-phenylether	190	U	
100-01-6	4-Nitroaniline	380	U	
534-52-1	4,6-Dinitro-2-methylphenol	380	U	
86-30-6	N-Nitrosodiphenylamin [1]	190	U	
95-94-3	1,2,4,5-Tetrachlorobenzene	190	U	
101-55-3	4-Bromophenyl-phenylether	190	U	
118-74-1	Hexachlorobenzene	190	U	
1912-24-9	Atrazine	190	U	
87-86-5	Pentachlorophenol	380	U	
85-01-8	Phenanthrene	51	J	
120-12-7	Anthracene	190	U	
86-74-8	Carbazole	190	U	
84-74-2	Di-n-butylphthalate	190 ~~18~~	~~J B~~	UB
206-44-0	Fluoranthene	85	J	
129-00-0	Pyrene	110	J	
85-68-7	Butylbenzylphthalate	190 ~~80~~	~~J B~~	UB
91-94-1	3,3'-Dichlorobenzidine	190	U	
56-55-3	Benzo(a)anthracene	50	J	
218-01-9	Chrysene	69	J	
117-81-7	Bis(2-ethylhexyl)phthalate	210	~~B~~	UB
117-84-0	Di-n-octylphthalate	190	U	
205-99-2	Benzo(b)fluoranthene	58	J	
207-08-9	Benzo(k)fluoranthene	65	J	
50-32-8	Benzo(a)pyrene	61	J	
193-39-5	Indeno(1,2,3-cd)pyrene	23	J	
53-70-3	Dibenzo(a,h)anthracene	190	U	
191-24-2	Benzo(g,h,i)perylene	27	J	
58-90-2	2,3,4,6-Tetrachlorophenol	190	U	

[1] Cannot be separated from Diphenylamine

1K - FORM I SV-TIC
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 30.8 (g/mL) g Lab File ID: RLAAU15.D

Level: (TRACE or LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013

Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/21/2013

GPC Cleanup: (Y/N) Y pH: 7.7 Dilution Factor: 1.0

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	E966796 [2]	Total Alkanes	N/A		

[2] EPA-designated Registry Number.

1D - FORM I SV-1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:
Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1
Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3
Sample wt/vol: 30.8 (g/mL) g Lab File ID: RLAAX09.D
Level: (LOW/MED) LOW Extraction: (Type) SONC
% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013
Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/22/2013
GPC Cleanup: (Y/N) Y pH: 7.7 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
100-52-7	Benzaldehyde	28	J
108-95-2	Phenol	190	U
111-44-4	Bis(2-chloroethyl)ether	190	U
95-57-8	2-Chlorophenol	190	U
95-48-7	2-Methylphenol	190	U
108-60-1	2,2'-Oxybis(1-chloropropane)	190	U
98-86-2	Acetophenone	110	J
106-44-5	4-Methylphenol	190	U
621-64-7	N-Nitroso-di-n-propylamine	190	U
67-72-1	Hexachloroethane	190	U
98-95-3	Nitrobenzene	190	U
78-59-1	Isophorone	190	U
88-75-5	2-Nitrophenol	190	U
105-67-9	2,4-Dimethylphenol	190	U
111-91-1	Bis(2-chloroethoxy)methane	190	U
120-83-2	2,4-Dichlorophenol	190	U
91-20-3	Naphthalene	3.3	J
106-47-8	4-Chloroaniline	190	U
87-68-3	Hexachlorobutadiene	190	U
105-60-2	Caprolactam	95	J
59-50-7	4-Chloro-3-methylphenol	190	U
91-57-6	2-Methylnaphthalene	190	U
77-47-4	Hexachlorocyclopentadiene	190	U
88-06-2	2,4,6-Trichlorophenol	190	U
95-95-4	2,4,5-Trichlorophenol	190	U
92-52-4	1,1'-Biphenyl	190	U
91-58-7	2-Chloronaphthalene	190	U
88-74-4	2-Nitroaniline	380	U
131-11-3	Dimethylphthalate	190	U
606-20-2	2,6-Dinitrotoluene	190	U
208-96-8	Acenaphthylene	190	U
99-09-2	3-Nitroaniline	380	U
83-32-9	Acenaphthene	190	U

1E - FORM I SV-2
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:
Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1
Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3
Sample wt/vol: 30.8 (g/mL) g Lab File ID: RLAAX09.D
Level: (LOW/MED) LOW Extraction: (Type) SONC
% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013
Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/22/2013
GPC Cleanup: (Y/N) Y pH: 7.7 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
51-28-5	2,4-Dinitrophenol	380	U
100-02-7	4-Nitrophenol	380	U
132-64-9	Dibenzofuran	190	U
121-14-2	2,4-Dinitrotoluene	190	U
84-66-2	Diethylphthalate	11	J
86-73-7	Fluorene	190	U
7005-72-3	4-Chlorophenyl-phenylether	190	U
100-01-6	4-Nitroaniline	380	U
534-52-1	4,6-Dinitro-2-methylphenol	380	U
86-30-6	N-Nitrosodiphenylamin [1]	190	U
95-94-3	1,2,4,5-Tetrachlorobenzene	190	U
101-55-3	4-Bromophenyl-phenylether	190	U
118-74-1	Hexachlorobenzene	190	U
1912-24-9	Atrazine	190	U
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	45	J
120-12-7	Anthracene	190	U
86-74-8	Carbazole	190	U
84-74-2	Di-n-butylphthalate	19	J B
206-44-0	Fluoranthene	78	J
129-00-0	Pyrene	130	J
85-68-7	Butylbenzylphthalate	88	J B
91-94-1	3,3'-Dichlorobenzidine	190	U
56-55-3	Benzo(a)anthracene	51	J
218-01-9	Chrysene	71	J
117-81-7	Bis(2-ethylhexyl)phthalate	220	B
117-84-0	Di-n-octylphthalate	190	U
205-99-2	Benzo(b)fluoranthene	59	J
207-08-9	Benzo(k)fluoranthene	78	J
50-32-8	Benzo(a)pyrene	69	J
193-39-5	Indeno(1,2,3-cd)pyrene	25	J
53-70-3	Dibenzo(a,h)anthracene	190	U
191-24-2	Benzo(g,h,i)perylene	24	J
58-90-2	2,3,4,6-Tetrachlorophenol	190	U

[1] Cannot be separated from Diphenylamine

1K - FORM I SV-TIC
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TS004 (072413)RE

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 30.8 (g/mL) g Lab File ID: RLAAX09.D

Level: (TRACE or LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013

Concentrated Extract Volume: 500 (uL) Date Extracted: 08/01/2013

Injection Volume: 2.0 (uL) GPC Factor: 2.0 Date Analyzed: 08/22/2013

GPC Cleanup: (Y/N) Y pH: 7.7 Dilution Factor: 1.0

CONCENTRATION UNITS:(ug/L or ug/kg) ug/kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	E966796 [2]	Total Alkanes	N/A		

[2] EPA-designated Registry Number.

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 30.6 (g/mL) g Lab File ID: 5005ATDSOM06.D

% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013

Extraction: (Type) SONC Date Extracted: 08/01/2013

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 08/28/2013

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.2 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
319-84-6	alpha-BHC	2.0 ~~0.056~~	~~J P~~	U
319-85-7	beta-BHC	2.0	U	
319-86-8	delta-BHC	2.0	U	
58-89-9	gamma-BHC (Lindane)	2.0	U	
76-44-8	Heptachlor	2.0 ~~0.79~~	~~J P B~~	UB
309-00-2	Aldrin	2.0	U	
1024-57-3	Heptachlor epoxide	2.0 ~~1.1~~	~~J P~~	U
959-98-8	Endosulfan I	2.0 ~~0.19~~	~~J P~~	U
60-57-1	Dieldrin	1.1	J	
72-55-9	4,4'-DDE	2.8	J	
72-20-8	Endrin	4.0	U	
33213-65-9	Endosulfan II	4.0 ~~0.39~~	~~J P B~~	UB
72-54-8	4,4'-DDD	1.0	J	
1031-07-8	Endosulfan sulfate	4.0 ~~0.55~~	~~J P~~	U
50-29-3	4,4'-DDT	2.5	J	
72-43-5	Methoxychlor	20	U	
53494-70-5	Endrin ketone	0.31	J	
7421-93-4	Endrin aldehyde	4.0 ~~0.52~~	~~J P~~	U
5103-71-9	alpha-Chlordane	17		
5103-74-2	gamma-Chlordane	16		
8001-35-2	Toxaphene	200	U	

1G - FORM I PEST
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 30.6 (g/mL) g Lab File ID: 5005ATDSOM07.D

% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013

Extraction: (Type) SONC Date Extracted: 08/01/2013

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 08/28/2013

Injection Volume: 1.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.7 Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
319-84-6	alpha-BHC	1.9	U	
319-85-7	beta-BHC	1.9	U	
319-86-8	delta-BHC	1.9 ~~0.16~~	~~J P~~	U
58-89-9	gamma-BHC (Lindane)	1.9	U	
76-44-8	Heptachlor	1.9 ~~0.14~~	~~J P B~~	UB
309-00-2	Aldrin	1.9	U	
1024-57-3	Heptachlor epoxide	1.9 ~~0.13~~	~~J P~~	U
959-98-8	Endosulfan I	1.9 ~~0.14~~	~~J P~~	U
60-57-1	Dieldrin	0.41	J ~~P~~	
72-55-9	4,4'-DDE	5.5		
72-20-8	Endrin	3.8	U	
33213-65-9	Endosulfan II	3.8	U	
72-54-8	4,4'-DDD	3.5	J	
1031-07-8	Endosulfan sulfate	3.8 ~~0.53~~	~~J P~~	U
50-29-3	4,4'-DDT	1.6	J	
72-43-5	Methoxychlor	19	U	
53494-70-5	Endrin ketone	3.8	U	
7421-93-4	Endrin aldehyde	3.8 ~~0.16~~	~~J P~~	U
5103-71-9	alpha-Chlordane	1.9 ~~0.29~~	~~J P~~	U
5103-74-2	gamma-Chlordane	1.9 ~~0.42~~	~~J P~~	U
8001-35-2	Toxaphene	190	U	

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-2

Sample wt/vol: 29.2 (g/mL) g Lab File ID: 5253CHASOM09.D

% Moisture: 18 Decanted: (Y/N) N Date Received: 07/24/2013

Extraction: (Type) SONC Date Extracted: 08/01/2013

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/14/2013

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.2 Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	41	U
11104-28-2	Aroclor-1221	41	U
11141-16-5	Aroclor-1232	41	U
53469-21-9	Aroclor-1242	41	U
12672-29-6	Aroclor-1248	41	U
11097-69-1	Aroclor-1254	13	J ~~P~~
11096-82-5	Aroclor-1260	8.0	J
37324-23-5	Aroclor-1262	41	U
11100-14-4	Aroclor-1268	41	U

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref No.: SDG No.: 200-17642-1

Matrix: (SOIL/SED/WATER) Soil Lab Sample ID: 200-17642-3

Sample wt/vol: 29.6 (g/mL) g Lab File ID: 5253CHASOM11.D

% Moisture: 14 Decanted: (Y/N) N Date Received: 07/24/2013

Extraction: (Type) SONC Date Extracted: 08/01/2013

Concentrated Extract Volume: 10000 (uL) Date Analyzed: 08/14/2013

Injection Volume: 1.0 (uL) GPC Factor: 1.0 Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.7 Sulfur Cleanup: (Y/N) Y

Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	39	U
11104-28-2	Aroclor-1221	39	U
11141-16-5	Aroclor-1232	39	U
53469-21-9	Aroclor-1242	39	U
12672-29-6	Aroclor-1248	39	U
11097-69-1	Aroclor-1254	39	U
11096-82-5	Aroclor-1260	39	U
37324-23-5	Aroclor-1262	39	U
11100-14-4	Aroclor-1268	39	U

Client Sample ID: TS003 (072413)

Lab Sample ID: 200-17642-2

Date Collected: 07/24/13 13:30

Matrix: Solid

Date Received: 07/24/13 16:40

Method: NJ DEP EPH - New Jersey - Extractable Petroleum Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Aromatics	28		2.0	2.0	mg/Kg			07/31/13 14:29	1
Total Aliphatics	78		2.0	2.0	mg/Kg			07/31/13 14:29	1
Total EPH	110		2.0	2.0	mg/Kg			07/31/13 14:29	1

Method: NJDEP EPH - New Jersey Extractable Petroleum Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C12-C16 Aliphatics	19		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C9-C12 Aliphatics	5.6		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C16-C21 Aliphatics	5.4		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C21-C40 Aliphatics	48		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C16-C21 Aromatics	4.0		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C10-C12 Aromatics	3.8		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C12-C16 Aromatics	2.4	U	2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1
C21-C36 Aromatic	20		2.4	2.4	mg/Kg	☼	07/30/13 00:37	07/30/13 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:26*	*1*
2-Fluorobiphenyl	*80*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:26*	*1*
2-Bromonaphthalene	*44*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:26*	*1*
1-Chlorooctadecane	*91*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:26*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.3				%			07/29/13 16:51	1
Percent Moisture	18.2				%			07/30/13 16:00	1

Client Sample ID: TS004 (072413)

Lab Sample ID: 200-17642-3

Date Collected: 07/24/13 14:30

Matrix: Solid

Date Received: 07/24/13 16:40

Method: NJ DEP EPH - New Jersey - Extractable Petroleum Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Aromatics	33		2.0	2.0	mg/Kg			07/31/13 14:29	1
Total Aliphatics	88		2.0	2.0	mg/Kg			07/31/13 14:29	1
Total EPH	120		2.0	2.0	mg/Kg			07/31/13 14:29	1

Method: NJDEP EPH - New Jersey Extractable Petroleum Hydrocarbons

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C12-C16 Aliphatics	19		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C9-C12 Aliphatics	5.2		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C16-C21 Aliphatics	8.1		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C21-C40 Aliphatics	55		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C16-C21 Aromatics	5.5		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C10-C12 Aromatics	3.1		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C12-C16 Aromatics	2.3	U	2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1
C21-C36 Aromatic	24		2.3	2.3	mg/Kg	☼	07/30/13 00:37	07/30/13 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:40*	*1*
2-Fluorobiphenyl	*81*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:40*	*1*
2-Bromonaphthalene	*44*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:40*	*1*

Client Sample ID: TS004 (072413)
Date Collected: 07/24/13 14:30
Date Received: 07/24/13 16:40

Lab Sample ID: 200-17642-3
Matrix: Solid
Percent Solids: 85.6

Method: NJDEP EPH - New Jersey Extractable Petroleum Hydrocarbons (Continued)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane	*96*		*40 - 140*	*07/30/13 00:37*	*07/30/13 19:40*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**14.4**				%			07/29/13 16:51	1
Percent Moisture	**15.5**				%			07/30/13 16:00	1

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref. No.: SDG No.: 200-1764

Matrix: SOIL Lab Sample Id: 200-17642-2

% Solids: 81.7 Date Received: 07/24/2013

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5000		J E	P
7440-36-0	Antimony	0.58	J	N	P
7440-38-2	Arsenic	7.6			P
7440-39-3	Barium	19.9		J E	P
7440-41-7	Beryllium	0.24	J		P
7440-43-9	Cadmium	0.14	J		P
7440-70-2	Calcium	2410		J E	P
7440-47-3	Chromium	18.8		J E	P
7440-48-4	Cobalt	1.9	J	E	P
7440-50-8	Copper	12.2			P
7439-89-6	Iron	15600		J E	P
7439-92-1	Lead	23.6			P
7439-95-4	Magnesium	885		J E	P
7439-96-5	Manganese	61.4		J E	P
7440-02-0	Nickel	20.2			P
7440-09-7	Potassium	1210		J E	P
7782-49-2	Selenium	1.0	J	N	P
7440-22-4	Silver	0.84	U		P
7440-23-5	Sodium	40.1	J		P
7440-28-0	Thallium	2.1	U		P
7440-62-2	Vanadium	24.2		J E	P
7440-66-6	Zinc	40.4		J E	P

Color Before: DARK BROWN Clarity Before: Texture: MEDIUM

Color After: TAN Clarity After: CLOUDY Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref. No.: SDG No.: 200-1764

Matrix: SOIL Lab Sample Id: 200-17642-2

% Solids: 81.7 Date Received: 07/24/2013

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.044	J		CV

Color Before: GRAY Clarity Before: CLOUDY Texture: FINE

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS003 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref. No.: SDG No.: 200-1764

Matrix: SOIL Lab Sample Id: 200-17642-2

% Solids: 81.7 Date Received: 07/24/2013

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	0.61	U		AS

Color Before: BROWN Clarity Before: Texture: FINE

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref. No.: SDG No.: 200-1764

Matrix: SOIL Lab Sample Id: 200-17642-3

% Solids: 85.6 Date Received: 07/24/2013

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6510		J ~~E~~	P
7440-36-0	Antimony	0.45	J	~~N~~	P
7440-38-2	Arsenic	9.3			P
7440-39-3	Barium	29.6		J ~~E~~	P
7440-41-7	Beryllium	0.25	J		P
7440-43-9	Cadmium	0.098	J		P
7440-70-2	Calcium	13200		J ~~E~~	P
7440-47-3	Chromium	12.4		J ~~E~~	P
7440-48-4	Cobalt	3.1	J	~~E~~	P
7440-50-8	Copper	11.3			P
7439-89-6	Iron	14400		J ~~E~~	P
7439-92-1	Lead	15.0			P
7439-95-4	Magnesium	1080		J ~~E~~	P
7439-96-5	Manganese	85.4		J ~~E~~	P
7440-02-0	Nickel	4.9			P
7440-09-7	Potassium	819		J ~~E~~	P
7782-49-2	Selenium	1.2	J	~~N~~	P
7440-22-4	Silver	0.41	J		P
7440-23-5	Sodium	90.2	J		P
7440-28-0	Thallium	2.1	U		P
7440-62-2	Vanadium	28.9		J ~~E~~	P
7440-66-6	Zinc	36.8		J ~~E~~	P

Color Before: DARK BROWN Clarity Before: Texture: MEDIUM

Color After: BROWN Clarity After: CLOUDY Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref. No.: SDG No.: 200-1764

Matrix: SOIL Lab Sample Id: 200-17642-3

% Solids: 85.6 Date Received: 07/24/2013

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.020	J		CV

Color Before: GRAY Clarity Before: CLOUDY Texture: FINE

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

TS004 (072413)

Lab Name: TESTAMERICA BURLINGTON Contract:

Lab Code: Case No.: Mod. Ref. No.: SDG No.: 200-1764

Matrix: SOIL Lab Sample Id: 200-17642-3

% Solids: 85.6 Date Received: 07/24/2013

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight): mg/kg

CAS No.	Analyte	Concentration	C	Q	M
57-12-5	Cyanide	0.45	J		AS

Color Before: BROWN Clarity Before: Texture: FINE

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB, Herbicide,
Metals and Miscellaneous Analyses

SDG#E3174

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20151R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # E3174 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB/ PEST/ HERB	MET	MISC
E3174	EFFLUENT002(080213)	E3174-02	Water	8/02/2013		X	X	X	X	X

Note: The sample INFLUENT002(080213) was also included in this SDG; however, the sample was not validated.

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260C, 8270D/8270D-SIM, 8081B, 8151A, and 8082A. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected as unusable. The compound 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.

VOLATILE ORGANIC COMPOUND (VOC) 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 8260C	Soil	48 hours from collection to extraction and 14 days from collection to analysis	Cool to <6°C
	Water	14 days from collection to analysis	Cool to <6°C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks, trip blanks, and equipment 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. Trip blanks measure sample storage contamination. Rinse blanks also 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 (common laboratory contaminant compounds are calculated at ten times) 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.

Target compounds were detected in the associated QA blanks; however, the associated sample results were non-detect. Therefore, qualification of the sample results was not required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99, and a RRF value greater than control limit (0.05).

4.2 Continuing Calibration (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard area counts were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
EFFLUENT002(080213)	Acrolein

The criteria used to evaluate the RPD between the LCS/LCSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS) Accuracy (%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/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) 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 8270D/8270D-SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution are acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration Verification (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
EFFLUENT002(080213)	Continuing %D	1,2-Dichlorobenzene	22.6%
		Fluorene	20.9%
		2,4-Dimethylphenol (SIM)	-21.6%
		2,4-Dichlorophenol (SIM)	-22.0%
		2,4-Dinitrophenol (SIM)	-73.8%
		Pentachlorophenol (SIM)	-46.3%
		3,3-Dichlorobenzidine (SIM)	-40.1%
		Benzo(a)pyrene (SIM)	-23.7%
		Indeno(1,2,3-cd)pyrene (SIM)	-27.3%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF < 0.05	Non-detect	R
		Detect	J
	RRF < 0.01[1]	Non-detect	R
		Detect	J
	RRF > 0.05 or RRF > 0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient < 0.99	Non-detect	UJ
		Detect	J
Continuing Calibration	%D > 20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D > 20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J

[1] RRF of 0.01 only applies to typically poor responding compounds (e.g. ketones, 1,4-dioxane, etc.)

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits, and that all SVOC surrogate recoveries be greater than ten percent.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
EFFLUENT002(080213)	Phenol-d6	AC
	2-Fluorophenol	AC
	2,4,6-Tribromophenol	AC
	Nitrobenzene-d5	> UL
	2-Fluorobiphenyl	AC
	Terphenyl-d14	AC

UL Upper control limit
AC Acceptable

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established

acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment/Field Blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X	X		
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System Performance and Column Resolution		X		X	
Initial Calibration %RSDs		X		X	
Continuing Calibration RRFs		X		X	
Continuing Calibration %Ds		X	X		
Instrument Tune and Performance Check		X		X	
Ion Abundance Criteria for Each Instrument Used		X		X	
Internal Standards		X		X	
Compound Identification and Quantitation					
A. Reconstructed Ion Chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of Sample Compounds Within the Established RT Windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting Limits Adjusted for Sample Dilutions		X		X	

%R Percent Recovery
RPD Relative Percent Difference
%RSD Relative Standard Deviation
%D Percent Difference

PESTICIDES 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 8081A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. pesticide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PESTICIDES

Pesticides: SW-846 8081A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

HERBICIDES 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 8151A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All compounds associated with calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial / Continuing	Analyte	Criteria
EFFLUENT002(080213)	CCV %D	2,4-DB	31.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial / Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
Continuing Calibration	%D > 15% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D > 15% (decrease in sensitivity)	Non-detect	UJ
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. herbicide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR HERBICIDES

Herbicides: SW-846 8151A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X	X		
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

POLYCHLORINATED BIPHENYLS (PCBs) 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 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analyses exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Sample Analysis

Field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected analyte results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PCBs

PCBs: SW-846 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
Laboratory Control Sample (LCS) Accuracy %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column (%D) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to (United States Environmental Protection Agency) SW-846 Methods 6010B, 7470A, 9012B, SM4500, SM5310, and SM2540. Data were reviewed in accordance with USEPA National Functional Guidelines of July 2002.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within the control limits.

  * Duplicate analysis is not within the control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected as unusable. 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.

METALS 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 6010B	Water	180 days from collection to analysis	Cool to <6°C; pH < 2 with HNO_3
	Soil	180 days from collection to analysis	Cool to <6°C
SW-846 7470A	Water	28 days from collection to analysis	Cool to <6°C pH < 2 with HNO_3
SW-846 7471B	Soil	28 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. laboratory method blanks and equipment 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 also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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 detected in the associated QA blanks; however, the associated sample results were greater than the BAL and/or were non-detect. Therefore, sample results greater than the BAL resulted in the removal of the laboratory qualifier (B). No other qualification of the sample results was required.

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (10%).

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within the control limits.

All initial and continuing calibration verification standard recoveries were within the control limits.

3.3 Reporting limit (RL) Check Standard

The RL check standard serves to verify the linearity of calibration of the analysis at the RL. The RL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the RL standard analysis are presented below in the RL standards evaluation table.

All RL standard recoveries were within the control limits.

3.4 ICP Interference Check Standard (ICS)

The ICS verifies the laboratories inter-element and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS) and Laboratory Duplicate Sample Analysis

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

4.1 MS Analysis

All metal analytes must exhibit recoveries within the established acceptance limits of 75% to 125%. The MS control limits do not apply for MSs performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS spiking concentration by a factor of four or greater. In instance where this is true, the data will not be qualified and the laboratory qualifier "N" will be removed. Sample results associated with MS exceedances where the parent samples are not site-specific are not qualified.

The MS analysis was not performed on a sample location within this SDG. The laboratory qualified the data due to MS failures in a non-project related sample. The laboratory qualifier "N" will be removed.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five 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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample analysis was not performed on a sample location 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 recoveries between the control limits of 80% and 120%.

The LCS analyses exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C and 7470A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
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
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) Accuracy (%R)					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Laboratory Duplicate Sample RPD					X
ICP Serial Dilution					X
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
RL Standard		X		X	
ICP Interference Check		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R – Percent recovery
RPD – Relative percent difference

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
Cyanide by SW-846 9012	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of greater than 12.
Total Suspended Solids By SM2540	Water	7 days from collection to analysis	Cool to <6 °C.
pH by EPA SM4500-H-B	Water	ASAP	None
Total Organic Carbon (TOC) by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte 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.

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

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All analytes associated with the initial and continuing calibrations were within the specified control limits. The correct frequency and type of standards were analyzed.

4. Matrix Spike (MS) / Laboratory Duplicate Analyses

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

4.1 4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

Sample location EFFLUENT002(080213) was used in the MS analysis. All analytes associated with the MS analyses exhibited acceptable recoveries.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample results exhibited RPD within the control limit.

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 recoveries between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

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 VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA Lloyd-Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted for sample dilutions		X		X	

%RSD – relative standard deviation
%R – percent recovery
RPD – relative percent difference
%D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: September 11, 2013

PEER REVIEW: Dennis Capria

DATE: September 12, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E3174
QUOTE NO.
COC Number 030237

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: Creamer Environmental
ADDRESS: 215 union street
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYREVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@CreamerEnvironmental.com
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

SEE ATTACHED EFFLUENT Limitations and Monitoring Requirements TABLE

PRESERVATIVES

COMMENTS

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
								A	B	C	E						
1.	Effluent 002(080213)	WATER		X	8/2/13	0900	10	2	1	1	10						
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	8/2/13 0930	1. [signature]
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 10:15 8-2-13 AM	RECEIVED FOR LAB BY: 3. [signature]

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: Site pH reading 6.68

Cooler Temp. 5°C
Ice in Cooler?: yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8260C	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH052329.D	1		08/04/13	VH080413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.5	U	0.2	0.5	1	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	1	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	1	ug/L
107-02-8	Acrolein	2.5	U J	0.5	2.5	5	ug/L
107-13-1	Acrylonitrile	2.5	U	1.8	2.5	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	1	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	1	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	1	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.5	U	0.4	0.5	1	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	1	ug/L
107-06-2	1,2-Dichloroethane	0.5	U	0.48	0.5	1	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	1	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	1	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	1	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	1	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	1	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	1	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	1	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	1	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.8		61 - 141		108%	SPK: 50
1868-53-7	Dibromofluoromethane	47.3		69 - 133		95%	SPK: 50
2037-26-5	Toluene-d8	49.8		65 - 126		100%	SPK: 50

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8260C	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH052329.D	1		08/04/13	VH080413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	47.2		58 - 135		94%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	59787	4.89				
540-36-3	1,4-Difluorobenzene	78751	5.62				
3114-55-4	Chlorobenzene-d5	71375	9.77				
3855-82-1	1,4-Dichlorobenzene-d4	36238	12.51				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8270D	% Moisture:	100
Sample Wt/Vol:	920 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF064676.D	1	08/05/13	08/13/13	PB71488

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1.1	U	0.59	1.1	10.9	ug/L
95-50-1	1,2-Dichlorobenzene	1.1	U	0.28	1.1	10.9	ug/L
541-73-1	1,3-Dichlorobenzene	1.1	U	0.14	1.1	10.9	ug/L
106-46-7	1,4-Dichlorobenzene	1.1	U	0.22	1.1	10.9	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1.1	U	0.18	1.1	10.9	ug/L
67-72-1	Hexachloroethane	1.1	U	0.27	1.1	10.9	ug/L
78-59-1	Isophorone	1.1	U	0.33	1.1	10.9	ug/L
88-75-5	2-Nitrophenol	1.1	U	0.57	1.1	10.9	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.1	U	0.16	1.1	10.9	ug/L
77-47-4	Hexachlorocyclopentadiene	1.1	U	0.26	1.1	10.9	ug/L
88-06-2	2,4,6-Trichlorophenol	1.1	U	0.61	1.1	10.9	ug/L
131-11-3	Dimethylphthalate	1.1	U	0.24	1.1	10.9	ug/L
606-20-2	2,6-Dinitrotoluene	1.1	U	0.35	1.1	10.9	ug/L
100-02-7	4-Nitrophenol	5.4	U	2.2	5.4	10.9	ug/L
121-14-2	2,4-Dinitrotoluene	1.1	U	1.1	1.1	10.9	ug/L
84-66-2	Diethylphthalate	1.1	U	0.41	1.1	10.9	ug/L
86-73-7	Fluorene	1.1	U	0.34	1.1	10.9	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2.2	U	0.8	2.2	10.9	ug/L
86-30-6	n-Nitrosodiphenylamine	1.1	U	0.65	1.1	10.9	ug/L
85-01-8	Phenanthrene	1.1	U	0.28	1.1	10.9	ug/L
120-12-7	Anthracene	1.1	U	0.17	1.1	10.9	ug/L
84-74-2	Di-n-butylphthalate	1.1	U	1.1	1.1	10.9	ug/L
206-44-0	Fluoranthene	1.1	U	0.43	1.1	10.9	ug/L
129-00-0	Pyrene	1.1	U	0.22	1.1	10.9	ug/L
85-68-7	Butylbenzylphthalate	1.1	U	0.21	1.1	10.9	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1.1	U	0.17	1.1	10.9	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	77.5		10 - 130		52%	SPK: 150
13127-88-3	Phenol-d6	43		10 - 130		29%	SPK: 150
4165-60-0	Nitrobenzene-d5	97		36 - 131		97%	SPK: 100
321-60-8	2-Fluorobiphenyl	140	*	39 - 131		139%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8270D	% Moisture:	100
Sample Wt/Vol:	920 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF064676.D	1	08/05/13	08/13/13	PB71488

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	170		25 - 155		116%	SPK: 150
1718-51-0	Terphenyl-d14	86		23 - 130		86%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	147455	5.72				
1146-65-2	Naphthalene-d8	727691	6.97				
15067-26-2	Acenaphthene-d10	354538	8.69				
1517-22-2	Phenanthrene-d10	614475	10.16				
1719-03-5	Chrysene-d12	630313	12.77				
1520-96-3	Perylene-d12	558420	14.09				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE082832.D	1	08/05/13	08/08/13	PB71493

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U J	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U J	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U J	0.02	1.3	2.5	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.25	U J	0.02	0.25	0.51	ug/L
92-87-5	Benzidine	1.2		0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U J	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.06	J	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.26		0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.18		0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U J	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.75	J	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.58		0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	65.1		10 - 160		43%	SPK: 150
13127-88-3	Phenol-d6	29.8		10 - 160		20%	SPK: 150
4165-60-0	Nitrobenzene-d5	80.4		20 - 139		80%	SPK: 100
321-60-8	2-Fluorobiphenyl	100		10 - 173		105%	SPK: 100
118-79-6	2,4,6-Tribromophenol	140		10 - 169		96%	SPK: 150
1718-51-0	Terphenyl-d14	100		20 - 171		101%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	50866	5.85				
1146-65-2	Naphthalene-d8	210606	7.71				
15067-26-2	Acenaphthene-d10	112683	10.37				
1517-22-2	Phenanthrene-d10	268771	12.34				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE082832.D	1	08/05/13	08/08/13	PB71493

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	324139	15.67				
1520-96-3	Perylene-d12	219389	17.97				

U = Not Detected
LOQ = Limit of Quantitation
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LOD = Limit of Detection
E = Value Exceeds Calibration Range
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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	920 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL004748.D	1	08/05/13	08/05/13	PB71491

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.011	U	0.006	0.011	0.054	ug/L
319-85-7	beta-BHC	0.011	U	0.009	0.011	0.054	ug/L
58-89-9	gamma-BHC (Lindane)	0.011	U	0.006	0.011	0.054	ug/L
76-44-8	Heptachlor	0.011	U	0.008	0.011	0.054	ug/L
309-00-2	Aldrin	0.011	U	0.007	0.011	0.054	ug/L
1024-57-3	Heptachlor epoxide	0.011	U	0.007	0.011	0.054	ug/L
959-98-8	Endosulfan I	0.011	U	0.007	0.011	0.054	ug/L
60-57-1	Dieldrin	0.011	U	0.005	0.011	0.054	ug/L
72-55-9	4,4-DDE	0.011	U	0.005	0.011	0.054	ug/L
72-20-8	Endrin	0.011	U	0.006	0.011	0.054	ug/L
33213-65-9	Endosulfan II	0.011	U	0.006	0.011	0.054	ug/L
72-54-8	4,4-DDD	0.011	U	0.008	0.011	0.054	ug/L
1031-07-8	Endosulfan Sulfate	0.011	U	0.007	0.011	0.054	ug/L
50-29-3	4,4-DDT	0.011	U	0.006	0.011	0.054	ug/L
7421-93-4	Endrin aldehyde	0.011	U	0.005	0.011	0.054	ug/L
8001-35-2	Toxaphene	0.109	U	0.109	0.109	0.543	ug/L
57-74-9	Chlordane	0.109	U	0.109	0.109	0.543	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	22.3		10 - 192		111%	SPK: 20
877-09-8	Tetrachloro-m-xylene	22.6		10 - 172		113%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	910 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PC014771.D	1	08/05/13	08/09/13	PB71492

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.11	U	0.105	0.11	0.549	ug/L
11104-28-2	Aroclor-1221	0.11	U	0.11	0.11	0.549	ug/L
11141-16-5	Aroclor-1232	0.11	U	0.11	0.11	0.549	ug/L
53469-21-9	Aroclor-1242	0.11	U	0.098	0.11	0.549	ug/L
12672-29-6	Aroclor-1248	0.11	U	0.11	0.11	0.549	ug/L
11097-69-1	Aroclor-1254	0.11	U	0.048	0.11	0.549	ug/L
11096-82-5	Aroclor-1260	0.11	U	0.089	0.11	0.549	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.5		35 - 137		83%	SPK: 20
2051-24-3	Decachlorobiphenyl	21.1		40 - 135		105%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
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Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	Water
Analytical Method:	SW8151A	% Moisture:	100 Decanted:
Sample Wt/Vol:	910 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Herbicide group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PE007144.D	1	08/05/13	08/06/13	PB71487

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
1918-00-9	DICAMBA	0.549	U	0.179	0.549	2.2	ug/L
120-36-5	DICHLORPROP	0.549	U	0.289	0.549	2.2	ug/L
94-75-7	2,4-D	0.549	U	0.382	0.549	2.2	ug/L
93-72-1	2,4,5-TP (Silvex)	0.549	U	0.166	0.549	2.2	ug/L
93-76-5	2,4,5-T	0.549	U	0.189	0.549	2.2	ug/L
94-82-6	2,4-DB	0.549	U	0.549	0.549	2.2	ug/L
88-85-7	DINOSEB	0.549	U	0.197	0.549	2.2	ug/L
SURROGATES							
19719-28-9	2,4-DCAA	451		43 - 172		90%	SPK: 500

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LOD = Limit of Detection
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Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	2.5	U	1	2.1	2.5	5	ug/L	08/02/13	08/05/13	SW6010B
7440-43-9	Cadmium	6.76		1	0.25	0.75	1.5	ug/L	08/02/13	08/05/13	SW6010B
7440-47-3	Chromium	1.25	U	1	0.55	1.25	2.5	ug/L	08/02/13	08/05/13	SW6010B
7440-50-8	Copper	3.24	J	1	1	2.5	5	ug/L	08/02/13	08/05/13	SW6010B
7439-92-1	Lead	1.5	U	1	1.3	1.5	3	ug/L	08/02/13	08/05/13	SW6010B
7439-97-6	Mercury	0.1	U	1	0.092	0.1	0.2	ug/L	08/02/13	08/05/13	SW7470A
7440-02-0	Nickel	268		1	2.1	5	10	ug/L	08/02/13	08/05/13	SW6010B
7782-49-2	Selenium	34	~~N~~	1	2.4	2.5	5	ug/L	08/02/13	08/05/13	SW6010B
7440-22-4	Silver	1.25	U	1	0.75	1.25	2.5	ug/L	08/02/13	08/05/13	SW6010B
7440-66-6	Zinc	268		1	3.25	5	10	ug/L	08/02/13	08/05/13	SW6010B

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/02/13 09:00:00
Project:	ARC Horseshoe Road	Date Received:	08/02/13
Client Sample ID:	EFFLUENT002(080213)	SDG No.:	E3174
Lab Sample ID:	E3174-02	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	08/06/13	08/07/13 11:25	9012B
pH	6.68		1	0	0	0	pH	08/02/13	08/02/13 08:31	SM4500-H B
TOC	0.64		1	0.08	0.25	0.5	mg/L	08/09/13	08/09/13 13:31	SM5310B
TSS	4	U	1	4	4	4	mg/L	08/02/13	08/02/13 11:50	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB, Herbicide, Metals and Miscellaneous Analyses

SDG#E2939 and E3529

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20361R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # E2939 and E3529 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB/ PEST/ HERB	MET	MISC
E2939	H2OOUT001(071513)	E2939-01	Water	7/15/2013		X	X	X	X	X
E3529	EFFLUENT2A	E3529-02	Water	8/30/2013					X	
	EFFLUENT2B	E3529-03	Water	8/30/2013					X	

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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260C, 8270D/8270D-SIM, 8081B, 8151A, and 8082A. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected as unusable. The compound 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.

VOLATILE ORGANIC COMPOUND (VOC) 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 8260C	Soil	48 hours from collection to extraction and 14 days from collection to analysis	Cool to <6°C
	Water	14 days from collection to analysis	Cool to <6°C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks, trip blanks, and equipment 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. Trip blanks measure sample storage contamination. Rinse blanks also 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 (common laboratory contaminant compounds are calculated at ten times) 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.

Target compounds were detected in the associated QA blanks; however, the associated sample results were non-detect. Therefore, qualification of the sample results was not required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99, and a RRF value greater than control limit (0.05).

4.2 Continuing Calibration (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard area counts were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

The LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) 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 8270D/8270D-SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution are acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration Verification (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
H2OOUT001(071513)	Continuing %D	Hexachlorocyclopentadiene	286%
		2,2-oxybis(1-Chloropropane)	-20.8%
		4-Nitrophenol	44.6%
		Benzo(a)pyrene (SIM)	-44.8%
		Indeno(1,2,3-cd)pyrene (SIM)	-39.4%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits, and that all SVOC surrogate recoveries be greater than ten percent.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with LCS analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery
H2OOUT001(071513)	2,2-oxybis(1-Chloropropane)	<LL but >10%
	Hexachlorocyclopentadiene	>UL
	2,6-Dinitrotoluene	<LL but >10%
	2,4-Dinitrotoluene	<LL but >10%

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment/Field Blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X	X		
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System Performance and Column Resolution		X		X	
Initial Calibration %RSDs		X		X	
Continuing Calibration RRFs		X		X	
Continuing Calibration %Ds		X	X		
Instrument Tune and Performance Check		X		X	
Ion Abundance Criteria for Each Instrument Used		X		X	
Internal Standards		X		X	
Compound Identification and Quantitation					
A. Reconstructed Ion Chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of Sample Compounds Within the Established RT Windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting Limits Adjusted for Sample Dilutions		X		X	

%R Percent Recovery
RPD Relative Percent Difference
%RSD Relative Standard Deviation
%D Percent Difference

PESTICIDES 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 8081A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. pesticide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PESTICIDES

Pesticides: SW-846 8081A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

HERBICIDES 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 8151A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All compounds associated with calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial / Continuing	Analyte	Criteria
H2OOUT001(071513)	CCV %D	2,4-DB	30.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial / Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
Continuing Calibration	%D > 15% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D > 15% (decrease in sensitivity)	Non-detect	UJ
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. herbicide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR HERBICIDES

Herbicides: SW-846 8151A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X	X		
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

POLYCHLORINATED BIPHENYLS (PCBs) 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 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analyses exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Sample Analysis

Field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected analyte results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PCBs

PCBs: SW-846 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
Laboratory Control Sample (LCS) Accuracy %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column (%D) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to (United States Environmental Protection Agency) SW-846 Methods 6010B, 7470A, 9012B, SM4500, SM5310, and SM2540. Data were reviewed in accordance with USEPA National Functional Guidelines of July 2002.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within the control limits.

  * Duplicate analysis is not within the control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected as unusable. 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.

METALS 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 6010B	Water	180 days from collection to analysis	Cool to <6°C; pH < 2 with HNO_3
	Soil	180 days from collection to analysis	Cool to <6°C
SW-846 7470A	Water	28 days from collection to analysis	Cool to <6°C pH < 2 with HNO_3
SW-846 7471B	Soil	28 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. laboratory method blanks and equipment 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 also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (10%).

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within the control limits.

All initial and continuing calibration verification standard recoveries were within the control limits.

3.3 Reporting limit (RL) Check Standard

The RL check standard serves to verify the linearity of calibration of the analysis at the RL. The RL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the RL standard analysis are presented below in the RL standards evaluation table.

All RL standard recoveries were within the control limits.

3.4 ICP Interference Check Standard (ICS)

The ICS verifies the laboratories inter-element and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS) and Laboratory Duplicate Sample Analysis

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

4.1 MS Analysis

All metal analytes must exhibit recoveries within the established acceptance limits of 75% to 125%. The MS control limits do not apply for MSs performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS spiking concentration by a factor of four or greater. In instance where this is true, the data will not be qualified and the laboratory qualifier "N" will be removed. Sample results associated with MS exceedances where the parent samples are not site-specific are not qualified.

The MS analysis was not performed on a sample location within this SDG. The laboratory qualified the data due to MS failures in a non-project related sample. The laboratory qualifier "N" will be removed.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five 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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample analysis was not performed on a sample location 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 recoveries between the control limits of 80% and 120%.

The LCS analyses exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C and 7470A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
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
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) Accuracy (%R)					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision (RPD)					X
Field/Laboratory Duplicate Sample RPD					X
ICP Serial Dilution					X
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
RL Standard		X		X	
ICP Interference Check		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R – Percent recovery
RPD – Relative percent difference

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
Cyanide by SW-846 9012	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of greater than 12.
Total Suspended Solids By SM2540	Water	7 days from collection to analysis	Cool to <6 °C.
pH by EPA SM4500-H-B	Water	ASAP	None
Total Organic Carbon (TOC) by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

Sample H2OOUT001(071513) was qualified by the laboratory for pH due to holding time; however the sample was analyzed within six hours of collection and therefore the qualifier was removed. All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte 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.

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

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All analytes associated with the initial and continuing calibrations were within the specified control limits. The correct frequency and type of standards were analyzed.

4. Matrix Spike (MS) / Laboratory Duplicate Analyses

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

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

Sample location H2OOUT001(071513) was used in the MS analysis. All analytes associated with the MS analyses exhibited acceptable recoveries.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample results exhibited RPD within the control limit.

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 recoveries between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

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 VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA Lloyd-Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted for sample dilutions		X		X	

%RSD – relative standard deviation
%R – percent recovery
RPD – relative percent difference
%D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: October 9, 2013

PEER REVIEW: Dennis Capria

DATE: October 11, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E2939
QUOTE NO.
COC Number 030012

CLIENT INFORMATION (REPORT TO BE SENT TO:)
COMPANY: Creamer Environmental
ADDRESS: 215 union st
CITY: Hackensack STATE: NJ ZIP: 07062
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION
PROJECT NAME: ARC Horseshoe Rd
PROJECT NO.: 12-2260 LOCATION: Sayreville
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@creamerenvironmental
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION
BILL TO: Creamer Environmental PO#:
ADDRESS: 215 union Street
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION
FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☒ YES ☐ NO 48 HR
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION
☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 SVOC-TCL BNA	2 SVOC-SIM	3 Pest	4 PCB	5 Herb	6 VOC TCL	7 Mercury+Metals ICP	8	9 PH	COMMENTS
1.	H2OOUT00K(071513)	water		X	7/15/13	1230		X	X	X	X	X	X	X	X		
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

PRESERVATIVES — COMMENTS: ← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. V. Albanese	7/15/13 1250	1. [signature] 1450
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME: 1600 7-15-13	RECEIVED FOR LAB BY:
3. [signature]		3. [signature]

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Cooler Temp. 5°C
Ice in Cooler?: yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

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CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8260C	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN007180.D	1		07/16/13	VN071613

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.5	U	0.2	0.5	1	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	1	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	1	ug/L
107-02-8	Acrolein	2.5	U	0.5	2.5	5	ug/L
107-13-1	Acrylonitrile	2.5	U	1.8	2.5	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	1	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	1	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	1	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.5	U	0.4	0.5	1	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	1	ug/L
107-06-2	1,2-Dichloroethane	0.5	U	0.48	0.5	1	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	1	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	1	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	1	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	1	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	1	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	1	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	1	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	1	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.9		61 - 141		106%	SPK: 50
1868-53-7	Dibromofluoromethane	50.6		69 - 133		101%	SPK: 50
2037-26-5	Toluene-d8	50.1		65 - 126		100%	SPK: 50

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8260C	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN007180.D	1		07/16/13	VN071613

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	45.4		58 - 135		91%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	470497	7.87				
540-36-3	1,4-Difluorobenzene	753634	8.79				
3114-55-4	Chlorobenzene-d5	681630	11.61				
3855-82-1	1,4-Dichlorobenzene-d4	311004	13.56				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8270D	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF064011.D	1	07/16/13	07/17/13	PB71032

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.56	1	10.3	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.27	1	10.3	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10.3	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.21	1	10.3	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	~~UQ~~ J	0.18	1	10.3	ug/L
67-72-1	Hexachloroethane	1	U	0.26	1	10.3	ug/L
78-59-1	Isophorone	1	U	0.31	1	10.3	ug/L
88-75-5	2-Nitrophenol	1	U	0.54	1	10.3	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10.3	ug/L
77-47-4	Hexachlorocyclopentadiene R	~~1~~	~~UQ~~	~~0.25~~	~~1~~	~~10.3~~	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.58	1	10.3	ug/L
131-11-3	Dimethylphthalate	1	U	0.23	1	10.3	ug/L
606-20-2	2,6-Dinitrotoluene	1	~~UQ~~ J	0.33	1	10.3	ug/L
100-02-7	4-Nitrophenol	5.2	U	2.1	5.2	10.3	ug/L
121-14-2	2,4-Dinitrotoluene	1	~~UQ~~ J	1	1	10.3	ug/L
84-66-2	Diethylphthalate	1	U	0.39	1	10.3	ug/L
86-73-7	Fluorene	1	U	0.32	1	10.3	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2.1	U	0.76	2.1	10.3	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.62	1	10.3	ug/L
85-01-8	Phenanthrene	1	U	0.27	1	10.3	ug/L
120-12-7	Anthracene	1	U	0.16	1	10.3	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10.3	ug/L
206-44-0	Fluoranthene	1	U	0.41	1	10.3	ug/L
129-00-0	Pyrene	1	U	0.21	1	10.3	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.2	1	10.3	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10.3	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	38.2		10 - 130		25%	SPK: 150
13127-88-3	Phenol-d6	36.3		10 - 130		24%	SPK: 150
4165-60-0	Nitrobenzene-d5	83.1		36 - 131		83%	SPK: 100
321-60-8	2-Fluorobiphenyl	79		39 - 131		79%	SPK: 100

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8270D	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF064011.D	1	07/16/13	07/17/13	PB71032

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	110		25 - 155		71%	SPK: 150
1718-51-0	Terphenyl-d14	49.3		23 - 130		49%	SPK: 100

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	175088	4.699
1146-65-2	Naphthalene-d8	690906	5.979
15067-26-2	Acenaphthene-d10	386706	7.67
1517-22-2	Phenanthrene-d10	714603	9.111
1719-03-5	Chrysene-d12	787382	11.671
1520-96-3	Perylene-d12	695719	12.962

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BB058181.D	1	07/16/13	07/18/13	PB71031

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U	0.02	0.26	0.52	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U J	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U J	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	28.8		10 - 160		19%	SPK: 150
13127-88-3	Phenol-d6	25.3		10 - 160		17%	SPK: 150
4165-60-0	Nitrobenzene-d5	44.7		20 - 139		45%	SPK: 100
321-60-8	2-Fluorobiphenyl	36.5		10 - 173		36%	SPK: 100
118-79-6	2,4,6-Tribromophenol	75.9		10 - 169		51%	SPK: 150
1718-51-0	Terphenyl-d14	28.3		20 - 171		28%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	111103	7.6				
1146-65-2	Naphthalene-d8	304734	9.84				
15067-26-2	Acenaphthene-d10	142923	12.86				
1517-22-2	Phenanthrene-d10	213871	15.38				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BB058181.D	1	07/16/13	07/18/13	PB71031

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	140671	19.85				
1520-96-3	Perylene-d12	48628	22.91				

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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	950 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PD018396.D	1	07/16/13	07/16/13	PB71030

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.011	U	0.005	0.011	0.053	ug/L
319-85-7	beta-BHC	0.011	U	0.009	0.011	0.053	ug/L
58-89-9	gamma-BHC (Lindane)	0.011	U	0.006	0.011	0.053	ug/L
76-44-8	Heptachlor	0.011	U	0.007	0.011	0.053	ug/L
309-00-2	Aldrin	0.011	U	0.007	0.011	0.053	ug/L
1024-57-3	Heptachlor epoxide	0.011	U	0.007	0.011	0.053	ug/L
959-98-8	Endosulfan I	0.011	U	0.006	0.011	0.053	ug/L
60-57-1	Dieldrin	0.011	U	0.005	0.011	0.053	ug/L
72-55-9	4,4-DDE	0.011	U	0.005	0.011	0.053	ug/L
72-20-8	Endrin	0.011	U	0.006	0.011	0.053	ug/L
33213-65-9	Endosulfan II	0.011	U	0.006	0.011	0.053	ug/L
72-54-8	4,4-DDD	0.011	U	0.007	0.011	0.053	ug/L
1031-07-8	Endosulfan Sulfate	0.011	U	0.006	0.011	0.053	ug/L
50-29-3	4,4-DDT	0.011	U	0.006	0.011	0.053	ug/L
7421-93-4	Endrin aldehyde	0.011	U	0.005	0.011	0.053	ug/L
8001-35-2	Toxaphene	0.105	U	0.105	0.105	0.526	ug/L
57-74-9	Chlordane	0.105	U	0.105	0.105	0.526	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	21.3		10 - 192		106%	SPK: 20
877-09-8	Tetrachloro-m-xylene	21.6		10 - 172		108%	SPK: 20

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J = Estimated Value
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D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	940 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB006835.D	1	07/16/13	07/16/13	PB71029

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.106	U	0.102	0.106	0.532	ug/L
11104-28-2	Aroclor-1221	0.106	U	0.106	0.106	0.532	ug/L
11141-16-5	Aroclor-1232	0.106	U	0.106	0.106	0.532	ug/L
53469-21-9	Aroclor-1242	0.106	U	0.095	0.106	0.532	ug/L
12672-29-6	Aroclor-1248	0.106	U	0.106	0.106	0.532	ug/L
11097-69-1	Aroclor-1254	0.106	U	0.047	0.106	0.532	ug/L
11096-82-5	Aroclor-1260	0.106	U	0.086	0.106	0.532	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	17.8		35 - 137		89%	SPK: 20
2051-24-3	Decachlorobiphenyl	18.8		40 - 135		94%	SPK: 20

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LOD = Limit of Detection
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Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	Water
Analytical Method:	SW8151A	% Moisture:	100 Decanted:
Sample Wt/Vol:	970 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Herbicide group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PE006953.D	1	07/16/13	07/16/13	PB71028

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
1918-00-9	DICAMBA	0.515	U	0.168	0.515	2.1	ug/L
120-36-5	DICHLORPROP	0.515	U	0.271	0.515	2.1	ug/L
94-75-7	2,4-D	0.515	U	0.359	0.515	2.1	ug/L
93-72-1	2,4,5-TP (Silvex)	0.515	U	0.156	0.515	2.1	ug/L
93-76-5	2,4,5-T	0.515	U	0.177	0.515	2.1	ug/L
94-82-6	2,4-DB	0.515	U	0.515	0.515	2.1	ug/L
88-85-7	DINOSEB	0.515	U	0.185	0.515	2.1	ug/L
SURROGATES							
19719-28-9	2,4-DCAA	394		43 - 172		79%	SPK: 500

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Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	18.6		1	2.1	2.5	5	ug/L	07/16/13	07/16/13	SW6010B
7440-43-9	Cadmium	0.75	U	1	0.25	0.75	1.5	ug/L	07/16/13	07/16/13	SW6010B
7440-47-3	Chromium	1.25	U	1	0.55	1.25	2.5	ug/L	07/16/13	07/16/13	SW6010B
7440-50-8	Copper	2.5	U	1	1	2.5	5	ug/L	07/16/13	07/16/13	SW6010B
7439-92-1	Lead	2.34	J	1	1.3	1.5	3	ug/L	07/16/13	07/16/13	SW6010B
7439-97-6	Mercury	0.1	U	1	0.092	0.1	0.2	ug/L	07/16/13	07/17/13	SW7470A
7440-02-0	Nickel	5	U	1	2.1	5	10	ug/L	07/16/13	07/16/13	SW6010B
7782-49-2	Selenium	2.5	U	1	2.4	2.5	5	ug/L	07/16/13	07/16/13	SW6010B
7440-22-4	Silver	1.25	UN	1	0.75	1.25	2.5	ug/L	07/16/13	07/16/13	SW6010B
7440-66-6	Zinc	5	U	1	3.25	5	10	ug/L	07/16/13	07/16/13	SW6010B

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	07/15/13 12:30:00
Project:	ARC Horseshoe Road	Date Received:	07/15/13
Client Sample ID:	H2OOUT001(071513)	SDG No.:	E2939
Lab Sample ID:	E2939-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	07/17/13	07/17/13 17:29	9012B
pH	9.18	~~H~~	1	0	0	0	pH	07/15/13	07/15/13 17:09	SM4500 pH B
TOC	0.36	J	1	0.08	0.25	0.5	mg/L	07/19/13	07/19/13 10:23	SM5310B
TSS	4	U	1	4	4	4	mg/L	07/19/13	07/19/13 09:00	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. / QUOTE NO. E3529
COC Number 029616

CLIENT INFORMATION (REPORT TO BE SENT TO:)
COMPANY: Creamer Environmental
ADDRESS: 215 Union ST
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION
PROJECT NAME: ARC - HORSESHOE RD
PROJECT NO.: 12-2260 LOCATION: SAYERVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@Creamerenvironmental
PHONE: 201-968-3300 FAX:

CLIENT BILLING INFORMATION
BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union ST
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION
FAX: 24HR DAYS *
HARD COPY: DAYS *
EDD: DAYS *
PREAPPROVED TAT: ☒ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION
☐ LEVEL 1: Results only ☐ Others
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format:

ANALYSIS: METALS TAL

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	INFLUENT 2A	WATER		X	8/30/13	0930		X									
2.	EFFLUENT 2A	WATER		X	8/30/13	0930		X									
3.	EFFLUENT 2B	WATER		X	8/30/13	1000		X									Hold
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	8/30 1000	1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 8/30/13 1440	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: Hold EFFLUENT 2B
Cooler Temp. 5°C
Ice in Cooler?: Y

Page 1 of 1

SHIPPED VIA: CLIENT: ☒ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☐ PICKED UP ☐ OVERNIGHT
Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/30/13
Project:	ARC Horseshoe Road	Date Received:	08/30/13
Client Sample ID:	EFFLUENT2A	SDG No.:	E3529
Lab Sample ID:	E3529-02	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	2.5	U	1	2.1	2.5	5	ug/L	08/30/13	09/03/13	SW6010
7440-43-9	Cadmium	0.75	U	1	0.25	0.75	1.5	ug/L	08/30/13	09/03/13	SW6010
7440-47-3	Chromium	1.77	J	1	0.55	1.25	2.5	ug/L	08/30/13	09/03/13	SW6010
7440-50-8	Copper	2.49	J	1	1	2.5	5	ug/L	08/30/13	09/03/13	SW6010
7439-92-1	Lead	2.06	J	1	1.3	1.5	3	ug/L	08/30/13	09/03/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.092	0.1	0.2	ug/L	09/03/13	09/03/13	SW7470A
7440-02-0	Nickel	21		1	2.1	5	10	ug/L	08/30/13	09/03/13	SW6010
7782-49-2	Selenium	2.5	U	1	2.4	2.5	5	ug/L	08/30/13	09/03/13	SW6010
7440-22-4	Silver	1.25	U	1	0.75	1.25	2.5	ug/L	08/30/13	09/03/13	SW6010
7440-66-6	Zinc	2020		1	3.25	5	10	ug/L	08/30/13	09/03/13	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	08/30/13
Project:	ARC Horseshoe Road	Date Received:	08/30/13
Client Sample ID:	EFFLUENT2B	SDG No.:	E3529
Lab Sample ID:	E3529-03	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	2.5	U	1	2.1	2.5	5	ug/L	08/30/13	09/03/13	SW6010
7440-43-9	Cadmium	0.75	U	1	0.25	0.75	1.5	ug/L	08/30/13	09/03/13	SW6010
7440-47-3	Chromium	1.25	U	1	0.55	1.25	2.5	ug/L	08/30/13	09/03/13	SW6010
7440-50-8	Copper	2.8	J	1	1	2.5	5	ug/L	08/30/13	09/03/13	SW6010
7439-92-1	Lead	2.44	J	1	1.3	1.5	3	ug/L	08/30/13	09/03/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.092	0.1	0.2	ug/L	09/04/13	09/04/13	SW7470A
7440-02-0	Nickel	37.7		1	2.1	5	10	ug/L	08/30/13	09/03/13	SW6010
7782-49-2	Selenium	2.5	U	1	2.4	2.5	5	ug/L	08/30/13	09/03/13	SW6010
7440-22-4	Silver	1.25	U	1	0.75	1.25	2.5	ug/L	08/30/13	09/03/13	SW6010
7440-66-6	Zinc	96.9		1	3.25	5	10	ug/L	08/30/13	09/03/13	SW6010

Color Before:	Clarity Before:	Texture:
Color After:	Clarity After:	Artifacts:
Comments: Metals Group1		

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB, Herbicide,
Metals and Miscellaneous Analyses

SDG#E3584 and E3830

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20413R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # E3584 and E3830 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB/ PEST	MET	MISC
E3584	EFFLUENT003(090513)	E3584-01	Water	9/5/2013		X	X	X	X	X
E3830	EFFLUENT004(092413)	E3830-01	Water	9/24/2013		X	X	X	X	X

Note: Samples INFLUENT003(090513) and INFLUENT004(092413) were not evaluated in this 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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260C, 8270D/8270D-SIM, 8081B, 8151A, and 8082A. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected as unusable. The compound 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.

VOLATILE ORGANIC COMPOUND (VOC) 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 8260C	Soil	48 hours from collection to extraction and 14 days from collection to analysis	Cool to <6°C
	Water	14 days from collection to analysis	Cool to <6°C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks, trip blanks, and equipment 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. Trip blanks measure sample storage contamination. Rinse blanks also 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 (common laboratory contaminant compounds are calculated at ten times) 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.

Target compounds were detected in the associated QA blanks; however, the associated sample results were non-detect. Therefore, qualification of the sample results was not required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99, and a RRF value greater than control limit (0.05).

4.2 Continuing Calibration (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard area counts were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

The LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) 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 8270D/8270D-SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution are acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration Verification (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
EFFLUENT003(090513)	Continuing %D	Dimethylphthalate	23.2%
		Diethylphthalate	36.5%
		Di-n-butylphthalate	34.7%
		Butylbenzylphthalate	32.6%
		Bis(2-ethylhexyl)phthalate	30.7%
EFFLUENT004(092413)	Continuing %D	2,4-Dinitrophenol (SIM)	-37.0%
		Pentachlorophenol (SIM)	-29.6%
		Benzidine (SIM)	52.3%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits, and that all SVOC surrogate recoveries be greater than ten percent.

All surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
EFFLUENT003(090513)	Isophorone	<LL but >10%	AC
	2,4,6-Trichlorophenol	<LL but >10%	AC
	Dimethylphthalate	<LL but >10%	AC
	2,6-Dinitrotoluene	<LL but >10%	<LL but >10%

Sample Locations	Compound	LCS Recovery	LCSD Recovery
EFFLUENT003(090513)	2,4-Dinitrotoluene	<LL but >10%	AC
	Fluorene	<LL but >10%	AC
	N-Nitrosodiphenylamine	<LL but >10%	AC
	Phenanthrene	<LL but >10%	AC
	Anthracene	<LL but >10%	AC
	Di-n-butylphthalate	<LL but >10%	AC
	Fluoranthene	<LL but >10%	AC
	Pyrene	<LL but >10%	AC

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
EFFLUENT003(090513)	2-Chlorophenol
	Anthracene
	Di-n-butylphthalate
	Fluoranthene

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment/Field Blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X	X		
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System Performance and Column Resolution		X		X	
Initial Calibration %RSDs		X		X	
Continuing Calibration RRFs		X		X	
Continuing Calibration %Ds		X	X		
Instrument Tune and Performance Check		X		X	
Ion Abundance Criteria for Each Instrument Used		X		X	
Internal Standards		X		X	
Compound Identification and Quantitation					
A. Reconstructed Ion Chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of Sample Compounds Within the Established RT Windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting Limits Adjusted for Sample Dilutions		X		X	

%R Percent Recovery
RPD Relative Percent Difference
%RSD Relative Standard Deviation
%D Percent Difference

PESTICIDES 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 8081A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All compounds associated with calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
EFFLUENT004(092413)	CCV %D	Heptachlor epoxide	16.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20%or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
Continuing Calibration	%D >15% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >15% (decrease in sensitivity)	Non-detect	UJ
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. pesticide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PESTICIDES

Pesticides: SW-846 8081A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X	X		
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

POLYCHLORINATED BIPHENYLS (PCBs) 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 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analyses exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Sample Analysis

Field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected analyte results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PCBs

PCBs: SW-846 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
Laboratory Control Sample (LCS) Accuracy %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column (%D) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to (United States Environmental Protection Agency) SW-846 Methods 6010B, 7470A, 9012B, SM4500, SM5310, and SM2540. Data were reviewed in accordance with USEPA National Functional Guidelines of July 2002.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within the control limits.

  * Duplicate analysis is not within the control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected as unusable. 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.

METALS 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 6010B	Water	180 days from collection to analysis	Cool to <6°C; pH < 2 with HNO_3
	Soil	180 days from collection to analysis	Cool to <6°C
SW-846 7470A	Water	28 days from collection to analysis	Cool to <6°C pH < 2 with HNO_3
SW-846 7471B	Soil	28 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. laboratory method blanks and equipment 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 also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (10%).

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within the control limits.

All initial and continuing calibration verification standard recoveries were within the control limits.

3.3 Reporting limit (RL) Check Standard

The RL check standard serves to verify the linearity of calibration of the analysis at the RL. The RL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the RL standard analysis are presented below in the RL standards evaluation table.

All RL standard recoveries were within the control limits.

3.4 ICP Interference Check Standard (ICS)

The ICS verifies the laboratories inter-element and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS) and Laboratory Duplicate Sample Analysis

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

4.1 MS Analysis

All metal analytes must exhibit recoveries within the established acceptance limits of 75% to 125%. The MS control limits do not apply for MSs performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS spiking concentration by a factor of four or greater. In instance where this is true, the data will not be qualified and the laboratory qualifier "N" will be removed. Sample results associated with MS exceedances where the parent samples are not site-specific are not qualified.

The MS analysis was not performed on a sample location within this SDG. The laboratory qualified the data due to MS failures in a non-project related sample. The laboratory qualifier "N" will be removed.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five 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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

All analytes associated with laboratory duplicate RPD were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analytes	Laboratory RPD
EFFLUENT004(092413)DUP	Chromium	200%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified. The qualifications are applied to the all

sample results associated with this SDG.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and laboratory sample concentration >5 times CRDL	Water 20% or Soil 35%	Non-detect	UJ
		Detect	J
Parent sample and/or laboratory duplicate sample result ≤ five times the RL and difference between samples >RL	Water one times RL or Soil two times RL	Non-detect	UJ
		Detect	J

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 recoveries between the control limits of 80% and 120%.

The LCS analyses exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C and 7470A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
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
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) Accuracy (%R)		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Laboratory Duplicate Sample RPD		X	X		
ICP Serial Dilution		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
RL Standard		X		X	
ICP Interference Check		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R – Percent recovery
RPD – Relative percent difference

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
Cyanide by SW-846 9012	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of greater than 12.
Total Suspended Solids By SM2540	Water	7 days from collection to analysis	Cool to <6 °C.
Total Organic Carbon (TOC) by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte 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.

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

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All analytes associated with the initial and continuing calibrations were within the specified control limits. The correct frequency and type of standards were analyzed.

4. Matrix Spike (MS) / Laboratory Duplicate Analyses

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

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

Sample location EFFLUENT003(090513) was used in the MS analysis. All analytes associated with the MS analyses exhibited acceptable recoveries.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample results exhibited RPD within the control limit.

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 recoveries between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

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 VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA Lloyd-Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted for sample dilutions		X		X	

%RSD – relative standard deviation
%R – percent recovery
RPD – relative percent difference
%D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: October 15, 2013

PEER REVIEW: Dennis Capria

DATE: October 18, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

Chemtech Project Number E3584

COC Number

13.1

CLIENT INFORMATION

Report to be sent to

COMPANY: CREAMER ENVIRONMENTAL INC
ADDRESS: 215 UNION ST
CITY: HACKENSACK STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201 - 968-3300 FAX: 201-968-3301

PROJECT INFORMATION

PROJECT NAME: ARC HORSESHOE RD
PROJECT #: 12-2260 LOCATION: SAYREVILLE
PROJECT MANAGER: GARY KOWALSKI
E-MAIL: GKOWALSKI@CREAMERENVIRONMENTAL.COM
PHONE: 201-481-9308 FAX:

BILLING INFORMATION

BILL TO: CREAMER ENVIRONMENTAL PO#
ADDRESS: 215 UNION STREET
CITY: HACKENSACK STAT NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS*
HARD COPY: 24 HR DAYS*
EDD _____ DAYS*
* TO BE APPROVED BY CHEMTECH
STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

- ☐ RESEULTS ONLY
- ☐ RESULTS * QC
- ☐ New Jersey REDUCED
- ✈ New Jersey CLP
- ☐ USEPA CLP
- ☐ New York State ASP "B"
- ☐ New York State ASP "A"
- ☐ Other _____
- ☐ EDD FORMAT _____

ANALYSIS

1 Herbicide	2 PEST	3 PCB	4 SVOC Group 1	5 SVOC Group 3	6 TSS	7 TOC	8 METALS	9 VOCMS Group 3

PRESERVATIVES

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# of Bottles	1	2	3	4	5	6	7	8	9	COMMENTS
1.	CFFLUENT003(090513)	WATER		X	9/5	1500		X	X	X	X	X	X	X	X	X	
2.	INFLUENT003(090513)	WATER		X	9/5	1500										X	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

<-- Specify Preservatives
A-HCl B-HNO4
C-H2SO13 D-NaOH
E-ICE F-OTHER

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE PROSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY
1. [signature]	9/5 1630	1.
RELINQUISHED BY 2.	DATE/TIME	RECEIVED BY 2.
RELINQUISHED BY 3. [signature]	DATE/TIME 16:40	RECEIVED FOR LAB BY 3. [signature]

Conditions of bottles or collers at receipt: ✈ COMPLIANT ✈ NON COMPLIANT ✈ COOLER TEMP 6°C
MeOH extraction requires an additional 4oz. Jar for percent solid
Comments:
ICE — YES

Page _____ of _____

CLIENT: ✈ Hand Delivered ✈ Overnight
CHEMTECH: ✈ Picked Up ✈

Shipment Complete
☐ YES ✈ NO

10/18/2004

WHITE - CHEMTECH COPYFOR RETURN TO CLIENT **YELLOW** - CHEMTECH COPY **PINK** - SAMPLER COPY #

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN008525.D	1		09/05/13	VN090513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44		61 - 141		88%	SPK: 50
1868-53-7	Dibromofluoromethane	48.5		69 - 133		97%	SPK: 50
2037-26-5	Toluene-d8	48		65 - 126		96%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN008525.D	1		09/05/13	VN090513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	42.8		58 - 135		86%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	484591	7.867				
540-36-3	1,4-Difluorobenzene	801628	8.786				
3114-55-4	Chlorobenzene-d5	714788	11.609				
3855-82-1	1,4-Dichlorobenzene-d4	311175	13.561				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8270D	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065316.D	1	09/06/13	09/06/13	PB72116

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.55	1	10.2	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.27	1	10.2	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10.2	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10.2	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10.2	ug/L
67-72-1	Hexachloroethane	1	U	0.26	1	10.2	ug/L
78-59-1	Isophorone	1	UQ J	0.31	1	10.2	ug/L
88-75-5	2-Nitrophenol	1	U	0.53	1	10.2	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10.2	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10.2	ug/L
88-06-2	2,4,6-Trichlorophenol	1	UQ J	0.57	1	10.2	ug/L
131-11-3	Dimethylphthalate	8.4	JQ	0.22	1	10.2	ug/L
606-20-2	2,6-Dinitrotoluene	1	UQ J	0.33	1	10.2	ug/L
100-02-7	4-Nitrophenol	5.1	U	2	5.1	10.2	ug/L
121-14-2	2,4-Dinitrotoluene	1	UQ J	1	1	10.2	ug/L
84-66-2	Diethylphthalate	1	U	0.39	1	10.2	ug/L
86-73-7	Fluorene	1	UQ J	0.32	1	10.2	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.76	2	10.2	ug/L
86-30-6	n-Nitrosodiphenylamine	1	UQ J	0.61	1	10.2	ug/L
85-01-8	Phenanthrene	1	UQ	0.27	1	10.2	ug/L
120-12-7	Anthracene	1	UQ	0.16	1	10.2	ug/L
84-74-2	Di-n-butylphthalate	1	UQ	1	1	10.2	ug/L
206-44-0	Fluoranthene	1	UQ	0.41	1	10.2	ug/L
129-00-0	Pyrene	1	UQ	0.2	1	10.2	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10.2	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	4.8	J	0.16	1	10.2	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	69.8		10 - 130		47%	SPK: 150
13127-88-3	Phenol-d6	49.4		10 - 130		33%	SPK: 150
4165-60-0	Nitrobenzene-d5	85.9		36 - 131		86%	SPK: 100
321-60-8	2-Fluorobiphenyl	76.6		39 - 131		77%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8270D	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065316.D	1	09/06/13	09/06/13	PB72116

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	130		25 - 155		85%	SPK: 150
1718-51-0	Terphenyl-d14	77.7		23 - 130		78%	SPK: 100

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	118386	5.28
1146-65-2	Naphthalene-d8	466335	6.52
15067-26-2	Acenaphthene-d10	274065	8.24
1517-22-2	Phenanthrene-d10	467785	9.69
1719-03-5	Chrysene-d12	447171	12.27
1520-96-3	Perylene-d12	434066	13.58

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083103.D	1	09/06/13	09/07/13	PB72119

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U	0.02	0.26	0.51	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	76		10 - 160		51%	SPK: 150
13127-88-3	Phenol-d6	46.7		10 - 160		31%	SPK: 150
4165-60-0	Nitrobenzene-d5	84.1		20 - 139		84%	SPK: 100
321-60-8	2-Fluorobiphenyl	94.4		10 - 173		94%	SPK: 100
118-79-6	2,4,6-Tribromophenol	130		10 - 169		88%	SPK: 150
1718-51-0	Terphenyl-d14	91.1		20 - 171		91%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	53901	5.72				
1146-65-2	Naphthalene-d8	224797	7.61				
15067-26-2	Acenaphthene-d10	122847	10.26				
1517-22-2	Phenanthrene-d10	264533	12.22				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083103.D	1	09/06/13	09/07/13	PB72119

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	267273	15.53				
1520-96-3	Perylene-d12	198760	17.74				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)RE	SDG No.:	E3584
Lab Sample ID:	E3584-01RE	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083117.D	1	09/06/13	09/09/13	PB72119

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U	0.02	0.26	0.51	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	73.1		10 - 160		49%	SPK: 150
13127-88-3	Phenol-d6	44.4		10 - 160		30%	SPK: 150
4165-60-0	Nitrobenzene-d5	97.9		20 - 139		98%	SPK: 100
321-60-8	2-Fluorobiphenyl	91.4		10 - 173		91%	SPK: 100
118-79-6	2,4,6-Tribromophenol	130		10 - 169		90%	SPK: 150
1718-51-0	Terphenyl-d14	85.9		20 - 171		86%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	46909	5.7				
1146-65-2	Naphthalene-d8	201377	7.58				
15067-26-2	Acenaphthene-d10	114452	10.23				
1517-22-2	Phenanthrene-d10	249315	12.19				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)RE	SDG No.:	E3584
Lab Sample ID:	E3584-01RE	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083117.D	1	09/06/13	09/09/13	PB72119

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	254211	15.5				
1520-96-3	Perylene-d12	202378	17.7				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	500 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL005323.D	1	09/06/13	09/06/13	PB72115

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.02	U	0.01	0.02	0.1	ug/L
319-85-7	beta-BHC	0.02	U	0.017	0.02	0.1	ug/L
58-89-9	gamma-BHC (Lindane)	0.02	U	0.011	0.02	0.1	ug/L
76-44-8	Heptachlor	0.02	U	0.014	0.02	0.1	ug/L
309-00-2	Aldrin	0.02	U	0.012	0.02	0.1	ug/L
1024-57-3	Heptachlor epoxide	0.02	U	0.013	0.02	0.1	ug/L
959-98-8	Endosulfan I	0.02	U	0.012	0.02	0.1	ug/L
60-57-1	Dieldrin	0.02	U	0.01	0.02	0.1	ug/L
72-55-9	4,4-DDE	0.02	U	0.01	0.02	0.1	ug/L
72-20-8	Endrin	0.02	U	0.012	0.02	0.1	ug/L
33213-65-9	Endosulfan II	0.02	U	0.011	0.02	0.1	ug/L
72-54-8	4,4-DDD	0.02	U	0.014	0.02	0.1	ug/L
1031-07-8	Endosulfan Sulfate	0.02	U	0.012	0.02	0.1	ug/L
50-29-3	4,4-DDT	0.02	U	0.012	0.02	0.1	ug/L
7421-93-4	Endrin aldehyde	0.02	U	0.01	0.02	0.1	ug/L
8001-35-2	Toxaphene	0.2	U	0.2	0.2	1	ug/L
57-74-9	Chlordane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	20.7		10 - 192		104%	SPK: 20
877-09-8	Tetrachloro-m-xylene	22.7		10 - 172		114%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	500 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PC015045.D	1	09/06/13	09/06/13	PB72114

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.2	U	0.192	0.2	1	ug/L
11104-28-2	Aroclor-1221	0.2	U	0.2	0.2	1	ug/L
11141-16-5	Aroclor-1232	0.2	U	0.2	0.2	1	ug/L
53469-21-9	Aroclor-1242	0.2	U	0.178	0.2	1	ug/L
12672-29-6	Aroclor-1248	0.2	U	0.2	0.2	1	ug/L
11097-69-1	Aroclor-1254	0.2	U	0.088	0.2	1	ug/L
11096-82-5	Aroclor-1260	0.2	U	0.162	0.2	1	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	16.6		35 - 137		83%	SPK: 20
2051-24-3	Decachlorobiphenyl	15.8		40 - 135		79%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8151A	% Moisture:	100 Decanted:
Sample Wt/Vol:	960 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Herbicide group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PE007405.D	1	09/06/13	09/09/13	PB72118

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
1918-00-9	DICAMBA	0.521	U	0.17	0.521	2.1	ug/L
120-36-5	DICHLORPROP	0.521	U	0.274	0.521	2.1	ug/L
94-75-7	2,4-D	0.521	U	0.363	0.521	2.1	ug/L
93-72-1	2,4,5-TP (Silvex)	0.521	U	0.157	0.521	2.1	ug/L
93-76-5	2,4,5-T	0.521	U	0.179	0.521	2.1	ug/L
94-82-6	2,4-DB	0.521	U	0.521	0.521	2.1	ug/L
88-85-7	DINOSEB	0.521	U	0.186	0.521	2.1	ug/L
SURROGATES							
19719-28-9	2,4-DCAA	361		43 - 172		72%	SPK: 500

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	Water
Analytical Method:	SW8151A	% Moisture:	100 Decanted:
Sample Wt/Vol:	960 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Herbicide group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PE007417.D	1	09/06/13	09/10/13	PB72118

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
1918-00-9	DICAMBA	0.521	U	0.17	0.521	2.1	ug/L
120-36-5	DICHLORPROP	0.521	U	0.274	0.521	2.1	ug/L
94-75-7	2,4-D	0.521	U	0.363	0.521	2.1	ug/L
93-72-1	2,4,5-TP (Silvex)	0.521	U	0.157	0.521	2.1	ug/L
93-76-5	2,4,5-T	0.521	U	0.179	0.521	2.1	ug/L
94-82-6	2,4-DB	0.521	U	0.521	0.521	2.1	ug/L
88-85-7	DINOSEB	0.521	U	0.186	0.521	2.1	ug/L
SURROGATES							
19719-28-9	2,4-DCAA	389		43 - 172		78%	SPK: 500

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U	1	4.2	5.0	10	ug/L	09/06/13	09/06/13	SW6010
7440-43-9	Cadmium	1.5	U	1	0.5	1.5	3	ug/L	09/06/13	09/06/13	SW6010
7440-47-3	Chromium	71.9	~~N~~	1	1.1	2.5	5	ug/L	09/06/13	09/06/13	SW6010
7440-50-8	Copper	3.3	J	1	2	5.0	10	ug/L	09/06/13	09/06/13	SW6010
7439-92-1	Lead	3	U	1	2.6	3.0	6	ug/L	09/06/13	09/06/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	09/06/13	09/09/13	SW7470A
7440-02-0	Nickel	22.4	~~N~~	1	4.2	10.0	20	ug/L	09/06/13	09/06/13	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	09/06/13	09/06/13	SW6010
7440-22-4	Silver	2.5	U	1	1.5	2.5	5	ug/L	09/06/13	09/06/13	SW6010
7440-66-6	Zinc	8.2	J	1	6.5	10.0	20	ug/L	09/06/13	09/06/13	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/05/13 15:00:00
Project:	ARC Horseshoe Road	Date Received:	09/05/13
Client Sample ID:	EFFLUENT003(090513)	SDG No.:	E3584
Lab Sample ID:	E3584-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	09/06/13	09/09/13 10:21	9012B
TOC	1.1		1	0.08	0.25	0.5	mg/L	09/09/13	09/09/13 12:30	SM5310B
TSS	4	U	1	4	4	4	mg/L	09/06/13	09/06/13 09:25	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E3830
QUOTE NO.
COC Number 030987

12.1

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Creamer Environmental
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: Sayreville
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@creamerenvironmental.com
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 PCB Group 1
2 PEST Group 1
3 SVOC SIM Group 1
4 SVOC/MS Group 3
5 TSS
6 VOC/MS Group 3
7 Metals ICP Group 1
8 TOC
9 Cyanide

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1 (E)	2 (E)	3 (E)	4 (E)	5 (E)	6 (A)	7 (B)	8 (C)	9 (D)	COMMENTS
1.	Effluent 004 (092413)	WATER		X	9/24/13	1100	10	X	X	X	X	X	X	X	X	X	
2.	Influent 004 (092413)	WATER		X	9/24/13	1120	10	X	X	X	X	X	X	X	X	X	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. V. Alfonso	9/24 1250	1. [signature]
RELINQUISHED BY: 2. [signature]	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 9/24/13 1420	RECEIVED FOR LAB BY: 3. PS

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
Cooler Temp. 6°C
MeOH extraction requires an additional 4 oz jar for percent solid.
Ice in Cooler?: YES
Comments: See Attached list for Analysis

Page 1 of 2

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
E3830

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN009107.D	1		09/25/13	VN092413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	50		61 - 141		100%	SPK: 50
1868-53-7	Dibromofluoromethane	50.1		69 - 133		100%	SPK: 50
2037-26-5	Toluene-d8	53.7		65 - 126		107%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN009107.D	1		09/25/13	VN092413

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	47.7		58 - 135		95%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	502134	7.867				
540-36-3	1,4-Difluorobenzene	806731	8.786				
3114-55-4	Chlorobenzene-d5	712472	11.609				
3855-82-1	1,4-Dichlorobenzene-d4	314626	13.561				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065729.D	1	09/25/13	09/25/13	PB72438

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.54	1	10	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.26	1	10	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10	ug/L
67-72-1	Hexachloroethane	1	U	0.25	1	10	ug/L
78-59-1	Isophorone	1	U	0.3	1	10	ug/L
88-75-5	2-Nitrophenol	1	U	0.52	1	10	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.56	1	10	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.32	1	10	ug/L
100-02-7	4-Nitrophenol	5	U	2	5	10	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10	ug/L
84-66-2	Diethylphthalate	1	U	0.38	1	10	ug/L
86-73-7	Fluorene	1	U	0.31	1	10	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.74	2	10	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.6	1	10	ug/L
85-01-8	Phenanthrene	1	U	0.26	1	10	ug/L
120-12-7	Anthracene	1	U	0.16	1	10	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10	ug/L
206-44-0	Fluoranthene	1	U	0.4	1	10	ug/L
129-00-0	Pyrene	1	U	0.2	1	10	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	74.5		10 - 130		50%	SPK: 150
13127-88-3	Phenol-d6	43.1		10 - 130		29%	SPK: 150
4165-60-0	Nitrobenzene-d5	120		36 - 131		117%	SPK: 100
321-60-8	2-Fluorobiphenyl	96.7		39 - 131		97%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065729.D	1	09/25/13	09/25/13	PB72438

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	130		25 - 155		88%	SPK: 150
1718-51-0	Terphenyl-d14	95		23 - 130		95%	SPK: 100

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	54381	5.7
1146-65-2	Naphthalene-d8	224135	6.94
15067-26-2	Acenaphthene-d10	133013	8.67
1517-22-2	Phenanthrene-d10	207305	10.15
1719-03-5	Chrysene-d12	202839	12.77
1520-96-3	Perylene-d12	193899	14.08

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	960 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083192.D	1	09/25/13	09/25/13	PB72447

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U J	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U J	0.02	0.26	0.52	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	62.2		10 - 160		41%	SPK: 150
13127-88-3	Phenol-d6	35.7		10 - 160		24%	SPK: 150
4165-60-0	Nitrobenzene-d5	95.1		20 - 139		95%	SPK: 100
321-60-8	2-Fluorobiphenyl	88.1		10 - 173		88%	SPK: 100
118-79-6	2,4,6-Tribromophenol	150		10 - 169		99%	SPK: 150
1718-51-0	Terphenyl-d14	99.7		20 - 171		100%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	48846	5.66				
1146-65-2	Naphthalene-d8	208939	7.54				
15067-26-2	Acenaphthene-d10	119812	10.19				
1517-22-2	Phenanthrene-d10	259021	12.16				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	960 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083192.D	1	09/25/13	09/25/13	PB72447

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	236701	15.47				
1520-96-3	Perylene-d12	175331	17.63				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	940 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL005653.D	1	09/25/13	09/25/13	PB72446

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.011	U	0.005	0.011	0.053	ug/L
319-85-7	beta-BHC	0.011	U	0.009	0.011	0.053	ug/L
58-89-9	gamma-BHC (Lindane)	0.011	U	0.006	0.011	0.053	ug/L
76-44-8	Heptachlor	0.011	U	0.007	0.011	0.053	ug/L
309-00-2	Aldrin	0.011	U	0.007	0.011	0.053	ug/L
1024-57-3	Heptachlor epoxide	0.011	U	0.007	0.011	0.053	ug/L
959-98-8	Endosulfan I	0.011	U	0.006	0.011	0.053	ug/L
60-57-1	Dieldrin	0.011	U	0.005	0.011	0.053	ug/L
72-55-9	4,4-DDE	0.011	U	0.005	0.011	0.053	ug/L
72-20-8	Endrin	0.011	U	0.006	0.011	0.053	ug/L
33213-65-9	Endosulfan II	0.011	U	0.006	0.011	0.053	ug/L
72-54-8	4,4-DDD	0.011	U	0.008	0.011	0.053	ug/L
1031-07-8	Endosulfan Sulfate	0.011	U	0.006	0.011	0.053	ug/L
50-29-3	4,4-DDT	0.011	U	0.006	0.011	0.053	ug/L
7421-93-4	Endrin aldehyde	0.011	U	0.005	0.011	0.053	ug/L
8001-35-2	Toxaphene	0.106	U	0.106	0.106	0.532	ug/L
57-74-9	Chlordane	0.106	U	0.106	0.106	0.532	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	25.2		10 - 192		126%	SPK: 20
877-09-8	Tetrachloro-m-xylene	24.2		10 - 172		121%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO011234.D	1	09/25/13	09/25/13	PB72445

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.1	U	0.096	0.1	0.5	ug/L
11104-28-2	Aroclor-1221	0.1	U	0.1	0.1	0.5	ug/L
11141-16-5	Aroclor-1232	0.1	U	0.1	0.1	0.5	ug/L
53469-21-9	Aroclor-1242	0.1	U	0.089	0.1	0.5	ug/L
12672-29-6	Aroclor-1248	0.1	U	0.1	0.1	0.5	ug/L
11097-69-1	Aroclor-1254	0.1	U	0.044	0.1	0.5	ug/L
11096-82-5	Aroclor-1260	0.1	U	0.081	0.1	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	17.1		35 - 137		86%	SPK: 20
2051-24-3	Decachlorobiphenyl	17.5		40 - 135		87%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
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E = Value Exceeds Calibration Range
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B = Analyte Found in Associated Method Blank
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* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U	1	4.2	5.0	10	ug/L	09/25/13	09/25/13	SW6010
7440-43-9	Cadmium	1.5	U	1	0.5	1.5	3	ug/L	09/25/13	09/25/13	SW6010
7440-47-3	Chromium	12.5	~~*~~ J	1	1.1	2.5	5	ug/L	09/25/13	09/25/13	SW6010
7440-50-8	Copper	5	U	1	2	5.0	10	ug/L	09/25/13	09/25/13	SW6010
7439-92-1	Lead	3	U	1	2.6	3.0	6	ug/L	09/25/13	09/25/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	09/25/13	09/26/13	SW7470A
7440-02-0	Nickel	20.8		1	4.2	10.0	20	ug/L	09/25/13	09/25/13	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	09/25/13	09/25/13	SW6010
7440-22-4	Silver	2.5	U	1	1.5	2.5	5	ug/L	09/25/13	09/25/13	SW6010
7440-66-6	Zinc	10	U	1	6.5	10.0	20	ug/L	09/25/13	09/25/13	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	09/24/13 11:00:00
Project:	ARC Horseshoe Road	Date Received:	09/24/13
Client Sample ID:	EFFLUENT004(092413)	SDG No.:	E3830
Lab Sample ID:	E3830-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	09/25/13	09/26/13 11:34	9012B
TOC	1.07		1	0.08	0.25	0.5	mg/L	09/25/13	09/25/13 13:57	SM5310B
TSS	4	U	1	4	4	4	mg/L	09/25/13	09/25/13 09:20	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB, Herbicide,
Metals and Miscellaneous Analyses

SDG#E3983, E4151, and E4315

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #20810R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # E3983, E4151, and E4315 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB/ PEST	MET	MISC
E3983	EFFLUENT005(100313)	E3983-01	Water	10/03/2013		X	X	X	X	X
E4151	EFFLUENT006(101713)	E4151-01	Water	10/17/2013		X	X	X	X	X
E4315	EFFLUENT007(110113)	E4315-01	Water	11/01/2013		X	X	X	X	X

Note:

1. Miscellaneous analyses include cyanide, TSS, and TOC.
2. Samples INFLUENT005(100313), INFLUENT006(101713) and INFLUENT007(110113) were not evaluated in this 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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260C, 8270D/8270D-SIM, 8081B, 8151A, and 8082A. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected as unusable. The compound 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.

VOLATILE ORGANIC COMPOUND (VOC) 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 8260C	Soil	48 hours from collection to extraction and 14 days from collection to analysis	Cool to <6°C
	Water	14 days from collection to analysis	Cool to <6°C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks, trip blanks, and equipment 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. Trip blanks measure sample storage contamination. Rinse blanks also 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 (common laboratory contaminant compounds are calculated at ten times) 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.

Target compounds were detected in the associated QA blanks; however, the associated sample results were non-detect. Therefore, qualification of the sample results was not required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99, and a RRF value greater than control limit (0.05).

4.2 Continuing Calibration (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
EFFLUENT007(110113)	Continuing %D	Chloromethane	-29.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard area counts were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
EFFLUENT007(110113)	Acrolein

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X	X		
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) 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 8270D/8270D-SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution are acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration Verification (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
EFFLUENT005(100313)	Continuing %D	2,4-Dinitrophenol (SIM)	-25.9%
EFFLUENT006(101713)	Continuing %D	Hexachlorocyclopentadiene	119.1%
EFFLUENT007(110113)	Continuing %D	Phenol (SIM)	-24.8%
		2,4-Dinitrophenol (SIM)	-46.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries

within the laboratory-established acceptance limits, and that all SVOC surrogate recoveries be greater than ten percent.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
EFFLUENT006(101713) (SIM Analysis)	Phenol-d6	> UL
	2-Fluorophenol	> UL
	2,4,6-Tribromophenol	> UL
	Nitrobenzene-d5	> UL
	2-Fluorobiphenyl	> UL
	Terphenyl-d14	> UL

UL Upper control limit

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Sample EFFLUENT006(101713) was reanalyzed and showed similar surrogate recoveries.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a

factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
EFFLUENT006(101713)	Hexachlorocyclopentadiene	>UL	>UL

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
EFFLUENT005(100313)	Benzo(k)fluoranthene

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment/Field Blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X	X		
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System Performance and Column Resolution		X		X	
Initial Calibration %RSDs		X		X	
Continuing Calibration RRFs		X		X	
Continuing Calibration %Ds		X	X		
Instrument Tune and Performance Check		X		X	
Ion Abundance Criteria for Each Instrument Used		X		X	
Internal Standards		X		X	
Compound Identification and Quantitation					
A. Reconstructed Ion Chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of Sample Compounds Within the Established RT Windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting Limits Adjusted for Sample Dilutions		X		X	

%R Percent Recovery
RPD Relative Percent Difference
%RSD Relative Standard Deviation
%D Percent Difference

PESTICIDES 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 8081A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All compounds associated with calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. pesticide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PESTICIDES

Pesticides: SW-846 8081A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

POLYCHLORINATED BIPHENYLS (PCBs) 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 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analyses exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Sample Analysis

Field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected analyte results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PCBs

PCBs: SW-846 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
Laboratory Control Sample (LCS) Accuracy %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column (%D) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to (United States Environmental Protection Agency) SW-846 Methods 6010B, 7470A, 9012B, SM4500, SM5310, and SM2540. Data were reviewed in accordance with USEPA National Functional Guidelines of July 2002.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within the control limits.

  * Duplicate analysis is not within the control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected as unusable. 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.

METALS 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 6010B	Water	180 days from collection to analysis	Cool to <6°C; pH < 2 with HNO_3
	Soil	180 days from collection to analysis	Cool to <6°C
SW-846 7470A	Water	28 days from collection to analysis	Cool to <6°C pH < 2 with HNO_3
SW-846 7471B	Soil	28 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. laboratory method blanks and equipment 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 also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (10%).

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within the control limits.

All initial and continuing calibration verification standard recoveries were within the control limits.

3.3 Reporting limit (RL) Check Standard

The RL check standard serves to verify the linearity of calibration of the analysis at the RL. The RL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the RL standard analysis are presented below in the RL standards evaluation table.

All RL standard recoveries were within the control limits.

3.4 ICP Interference Check Standard (ICS)

The ICS verifies the laboratories inter-element and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS) and Laboratory Duplicate Sample Analysis

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

4.1 MS Analysis

All metal analytes must exhibit recoveries within the established acceptance limits of 75% to 125%. The MS control limits do not apply for MSs performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS spiking concentration by a factor of four or greater. In instance where this is true, the data will not be qualified and the laboratory qualifier "N" will be removed. Sample results associated with MS exceedances where the parent samples are not site-specific are not qualified.

All analytes associated with MS/MSD recoveries were within control limits with the exception of the following analyte present in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
EFFLUENT006(101713)	Arsenic	59.0%	AC
	Cadmium	63.0%	AC
	Chromium	60.0%	AC
	Copper	59.0%	AC
	Lead	60.0%	AC
	Nickel	65.0%	AC
	Selenium	62.0%	AC
	Silver	59.0%	AC

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.

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

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five 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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The MS/MSD was performed in addition to the laboratory duplicate analysis. Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit are presented in the following table.

Sample Locations	Analyte
EFFLUENT006(101713)	Arsenic
	Cadmium
	Chromium
	Copper
	Lead
	Selenium

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

Control Limit	Sample Result	Qualification
> 20% (water) or >35% (soil	Non-detect	UJ
	Detect	J

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 recoveries between the control limits of 80% and 120%.

The LCS analyses exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C and 7470A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
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
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) Accuracy (%R)		X	X		
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X	X		
Field/Laboratory Duplicate Sample RPD		X		X	
ICP Serial Dilution		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
RL Standard		X		X	
ICP Interference Check		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R – Percent recovery
RPD – Relative percent difference

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
Cyanide by SW-846 9012	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of greater than 12.
Total Suspended Solids By SM2540	Water	7 days from collection to analysis	Cool to <6 °C.
Total Organic Carbon (TOC) by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte 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.

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

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All analytes associated with the initial and continuing calibrations were within the specified control limits. The correct frequency and type of standards were analyzed.

4. Matrix Spike (MS) / Laboratory Duplicate Analyses

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

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

Sample locations EFFLUENT005(100313) and EFFLUENT007(110113) were used in the MS analysis. All analytes associated with the MS analyses exhibited acceptable recoveries.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample results exhibited RPD within the control limit.

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 recoveries between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

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 VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA Lloyd-Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted for sample dilutions		X		X	

%RSD – relative standard deviation
%R – percent recovery
RPD – relative percent difference
%D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: December 16, 2013

PEER REVIEW: Dennis Capria

DATE: December 23, 2013

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E3983
QUOTE NO.
COC Number 030659

10.1

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: Creamer Environmental
ADDRESS: 215 UNION ST
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYREVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@creamerenvironmental
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 PCB Group 1
2 PEST Group 1
3 SVOC-SIM Group 1
4 SVOCMS Group 3
5 TSS
6 VOCMS Group 3
7 Metals ICP-Group 1
8 TOC
9 CYANIDE
Field pH

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS (← Specify Preservatives: A–HCl B–HNO_3 C–H_2SO_4 D–NaOH E–ICE F–Other)
								E	E	E	E	E	A	B	C	D	
1.	EFFLUENT005(100313)	WATER		X	10/3	11:00	10	X	X	X	X	X	X	X	X	X	
2.	INFLUENT005(100313)	WATER		X	10/3	11:30	10	X	X	X	X	X	X	X	X	X	
3. 3	Field pH - 7.29	WATER		X	10/3	1000	1										Field pH 7.29
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. V. Alvarez	10/3 12:00	1. J. Carter 1430
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
2.		2.
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:
3. J. Carter	10·3·13 1510	3. Snehal Mehta

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: See Attached list for Analysis

Cooler Temp. 5°
Ice in Cooler?: Yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
E3983

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN009398.D	1		10/10/13	VN100913

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.5		61 - 141		91%	SPK: 50
1868-53-7	Dibromofluoromethane	48.3		69 - 133		96%	SPK: 50
2037-26-5	Toluene-d8	47.1		65 - 126		94%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN009398.D	1		10/10/13	VN100913

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	43.5		58 - 135		87%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	559305	7.87				
540-36-3	1,4-Difluorobenzene	782576	8.79				
3114-55-4	Chlorobenzene-d5	662319	11.61				
3855-82-1	1,4-Dichlorobenzene-d4	274447	13.56				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065926.D	1	10/04/13	10/07/13	PB72670

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.54	1	10	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.26	1	10	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10	ug/L
67-72-1	Hexachloroethane	1	U	0.25	1	10	ug/L
78-59-1	Isophorone	1	U	0.3	1	10	ug/L
88-75-5	2-Nitrophenol	1	U	0.52	1	10	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.56	1	10	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.32	1	10	ug/L
100-02-7	4-Nitrophenol	5	U	2	5	10	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10	ug/L
84-66-2	Diethylphthalate	1	U	0.38	1	10	ug/L
86-73-7	Fluorene	1	U	0.31	1	10	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.74	2	10	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.6	1	10	ug/L
85-01-8	Phenanthrene	1	U	0.26	1	10	ug/L
120-12-7	Anthracene	1	U	0.16	1	10	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10	ug/L
206-44-0	Fluoranthene	1	U	0.4	1	10	ug/L
129-00-0	Pyrene	1	U	0.2	1	10	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	64.6		10 - 130		43%	SPK: 150
13127-88-3	Phenol-d6	40.4		10 - 130		27%	SPK: 150
4165-60-0	Nitrobenzene-d5	98.1		36 - 131		98%	SPK: 100
321-60-8	2-Fluorobiphenyl	94.9		39 - 131		95%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF065926.D	1	10/04/13	10/07/13	PB72670

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	160		25 - 155		107%	SPK: 150
1718-51-0	Terphenyl-d14	96.8		23 - 130		97%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	72073	5.54				
1146-65-2	Naphthalene-d8	241931	6.79				
15067-26-2	Acenaphthene-d10	125513	8.51				
1517-22-2	Phenanthrene-d10	280758	9.98				
1719-03-5	Chrysene-d12	227120	12.59				
1520-96-3	Perylene-d12	224933	13.9				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083402.D	1	10/04/13	10/08/13	PB72669

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U J	0.02	1.3	2.5	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.25	U	0.02	0.25	0.5	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U J	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	53.8		10 - 160		36%	SPK: 150
13127-88-3	Phenol-d6	32		10 - 160		21%	SPK: 150
4165-60-0	Nitrobenzene-d5	82.3		20 - 139		82%	SPK: 100
321-60-8	2-Fluorobiphenyl	72.7		10 - 173		73%	SPK: 100
118-79-6	2,4,6-Tribromophenol	120		10 - 169		82%	SPK: 150
1718-51-0	Terphenyl-d14	82.8		20 - 171		83%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	34762	5.61				
1146-65-2	Naphthalene-d8	151925	7.5				
15067-26-2	Acenaphthene-d10	90730	10.15				
1517-22-2	Phenanthrene-d10	191736	12.11				

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083402.D	1	10/04/13	10/08/13	PB72669

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	189947	15.42				
1520-96-3	Perylene-d12	148752	17.57				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL005713.D	1	10/04/13	10/04/13	PB72668

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.005	0.01	0.05	ug/L
319-85-7	beta-BHC	0.01	U	0.009	0.01	0.05	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.006	0.01	0.05	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.01	0.05	ug/L
309-00-2	Aldrin	0.01	U	0.006	0.01	0.05	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.007	0.01	0.05	ug/L
959-98-8	Endosulfan I	0.01	U	0.006	0.01	0.05	ug/L
60-57-1	Dieldrin	0.01	U	0.005	0.01	0.05	ug/L
72-55-9	4,4-DDE	0.01	U	0.005	0.01	0.05	ug/L
72-20-8	Endrin	0.01	U	0.006	0.01	0.05	ug/L
33213-65-9	Endosulfan II	0.01	U	0.006	0.01	0.05	ug/L
72-54-8	4,4-DDD	0.01	U	0.007	0.01	0.05	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.006	0.01	0.05	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.01	0.05	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.005	0.01	0.05	ug/L
8001-35-2	Toxaphene	0.1	U	0.1	0.1	0.5	ug/L
57-74-9	Chlordane	0.1	U	0.1	0.1	0.5	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	16.9		10 - 192		84%	SPK: 20
877-09-8	Tetrachloro-m-xylene	20.2		10 - 172		101%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	960 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB007772.D	1	10/04/13	10/04/13	PB72667

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.104	U	0.1	0.104	0.521	ug/L
11104-28-2	Aroclor-1221	0.104	U	0.104	0.104	0.521	ug/L
11141-16-5	Aroclor-1232	0.104	U	0.104	0.104	0.521	ug/L
53469-21-9	Aroclor-1242	0.104	U	0.093	0.104	0.521	ug/L
12672-29-6	Aroclor-1248	0.104	U	0.104	0.104	0.521	ug/L
11097-69-1	Aroclor-1254	0.104	U	0.046	0.104	0.521	ug/L
11096-82-5	Aroclor-1260	0.104	U	0.084	0.104	0.521	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	19.9		35 - 137		99%	SPK: 20
2051-24-3	Decachlorobiphenyl	21		40 - 135		105%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U	1	4.2	5.0	10	ug/L	10/04/13	10/04/13	SW6010
7440-43-9	Cadmium	1.5	U	1	0.5	1.5	3	ug/L	10/04/13	10/04/13	SW6010
7440-47-3	Chromium	2.5	U	1	1.1	2.5	5	ug/L	10/04/13	10/04/13	SW6010
7440-50-8	Copper	5	U	1	2	5.0	10	ug/L	10/04/13	10/04/13	SW6010
7439-92-1	Lead	3	U	1	2.6	3.0	6	ug/L	10/04/13	10/04/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	10/04/13	10/07/13	SW7470A
7440-02-0	Nickel	10	U	1	4.2	10.0	20	ug/L	10/04/13	10/04/13	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	10/04/13	10/04/13	SW6010
7440-22-4	Silver	2.5	U	1	1.5	2.5	5	ug/L	10/04/13	10/04/13	SW6010
7440-66-6	Zinc	10	U	1	6.5	10.0	20	ug/L	10/04/13	10/04/13	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/03/13 11:00:00
Project:	ARC Horseshoe Road	Date Received:	10/03/13
Client Sample ID:	EFFLUENT005(100313)	SDG No.:	E3983
Lab Sample ID:	E3983-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	10/04/13	10/04/13 14:07	9012B
TOC	0.677		1	0.08	0.25	0.5	mg/L	10/07/13	10/07/13 13:24	SM5310B
TSS	4	U	1	4	4	4	mg/L	10/04/13	10/04/13 09:15	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E4151
QUOTE NO.
COC Number 030800

11.1

CLIENT INFORMATION (REPORT TO BE SENT TO:)

COMPANY: Creamer Environmental INC
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Hoboken RD
PROJECT NO.: 12-2260 LOCATION: SAYREVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: G.Kowalski@creamerenvironmental
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: STANDARD DAYS *
HARD COPY: DAYS *
EDD: DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format:

ANALYSIS

1 PCB Group 1
2 PEST Group 1
3 SVOC-SIM Gr. 1
4 SVOCMS Gr. 3
5 TSS
6 VOCMS Gr. 3
7 Metals - KP-Gr 1
8 TOC
9 CYANIDE
Field pH

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
								E	E	E	E	E	A	B	C	D	← Specify Preservatives A-HCl B-HNO3 C-H2SO4 D-NaOH E-ICE F-Other
1.	EFFLUENT006(10/17/13)	WATER		X	10/17	12:30		X	X	X	X	X	X	X	X	X	
2.	INFLUENT006(10/17/13)	WATER		X	10/17	1300		X	X	X	X	X	X	X	X	X	
3.	Field pH	WATER		X	10/17												pH 6.60
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	10/17/13 1450	1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 10/17/13 1615	RECEIVED FOR LAB BY: 3.

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°C
Ice in Cooler?: ✓

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN009873.D	1		10/24/13	VN102313

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44.7		61 - 141		89%	SPK: 50
1868-53-7	Dibromofluoromethane	44.9		69 - 133		90%	SPK: 50
2037-26-5	Toluene-d8	45		65 - 126		90%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN009873.D	1		10/24/13	VN102313

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	39.3		58 - 135		79%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	392216	7.867				
540-36-3	1,4-Difluorobenzene	571648	8.787				
3114-55-4	Chlorobenzene-d5	472630	11.61				
3855-82-1	1,4-Dichlorobenzene-d4	177092	13.561				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083545.D	1	10/18/13	10/21/13	PB72942

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U	0.02	0.26	0.51	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	59	*	10 - 160		393%	SPK: 15
13127-88-3	Phenol-d6	35.7	*	10 - 160		238%	SPK: 15
4165-60-0	Nitrobenzene-d5	71.4	*	20 - 139		713%	SPK: 10
321-60-8	2-Fluorobiphenyl	76.1	*	10 - 173		761%	SPK: 10
118-79-6	2,4,6-Tribromophenol	110	*	10 - 169		758%	SPK: 15
1718-51-0	Terphenyl-d14	72.6	*	20 - 171		726%	SPK: 10
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	27202	5.56				
1146-65-2	Naphthalene-d8	111132	7.44				
15067-26-2	Acenaphthene-d10	65226	10.1				
1517-22-2	Phenanthrene-d10	141886	12.07				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083545.D	1	10/18/13	10/21/13	PB72942

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	161860	15.38				
1520-96-3	Perylene-d12	124617	17.49				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)RE	SDG No.:	E4151
Lab Sample ID:	E4151-01RE	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083661.D	1	10/18/13	11/02/13	PB72942

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U	0.02	0.26	0.51	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	63.9	*	10 - 160		426%	SPK: 15
13127-88-3	Phenol-d6	25.9	*	10 - 160		173%	SPK: 15
4165-60-0	Nitrobenzene-d5	40.7	*	20 - 139		407%	SPK: 10
321-60-8	2-Fluorobiphenyl	71.8	*	10 - 173		718%	SPK: 10
118-79-6	2,4,6-Tribromophenol	130	*	10 - 169		859%	SPK: 15
1718-51-0	Terphenyl-d14	87	*	20 - 171		870%	SPK: 10
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	47594	7				
1146-65-2	Naphthalene-d8	303472	8.95				
15067-26-2	Acenaphthene-d10	122717	11.74				
1517-22-2	Phenanthrene-d10	239081	14.12				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)RE	SDG No.:	E4151
Lab Sample ID:	E4151-01RE	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083661.D	1	10/18/13	11/02/13	PB72942

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	183138	18.4				
1520-96-3	Perylene-d12	128000	20.52				

U = Not Detected
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LOD = Limit of Detection
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF066204.D	1	10/18/13	10/18/13	PB72943

CAS Number	Parameter		Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
95-57-8	2-Chlorophenol		1	U	0.55	1	10.1	ug/L
95-50-1	1,2-Dichlorobenzene		1	U	0.26	1	10.1	ug/L
541-73-1	1,3-Dichlorobenzene		1	U	0.13	1	10.1	ug/L
106-46-7	1,4-Dichlorobenzene		1	U	0.2	1	10.1	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)		1	U	0.17	1	10.1	ug/L
67-72-1	Hexachloroethane		1	U	0.25	1	10.1	ug/L
78-59-1	Isophorone		1	U	0.3	1	10.1	ug/L
88-75-5	2-Nitrophenol		1	U	0.53	1	10.1	ug/L
120-82-1	1,2,4-Trichlorobenzene		1	U	0.15	1	10.1	ug/L
77-47-4	Hexachlorocyclopentadiene	R	~~1~~	~~UJ~~	~~0.24~~	~~1~~	~~10.1~~	~~ug/L~~
88-06-2	2,4,6-Trichlorophenol		1	U	0.57	1	10.1	ug/L
131-11-3	Dimethylphthalate		5.8	J	0.22	1	10.1	ug/L
606-20-2	2,6-Dinitrotoluene		1	U	0.32	1	10.1	ug/L
100-02-7	4-Nitrophenol		5.1	U	2	5.1	10.1	ug/L
121-14-2	2,4-Dinitrotoluene		1	U	1	1	10.1	ug/L
84-66-2	Diethylphthalate		1	U	0.38	1	10.1	ug/L
86-73-7	Fluorene		1	U	0.31	1	10.1	ug/L
534-52-1	4,6-Dinitro-2-methylphenol		2	U	0.75	2	10.1	ug/L
86-30-6	n-Nitrosodiphenylamine		1	U	0.61	1	10.1	ug/L
85-01-8	Phenanthrene		1	U	0.26	1	10.1	ug/L
120-12-7	Anthracene		1	U	0.16	1	10.1	ug/L
84-74-2	Di-n-butylphthalate		1	U	1	1	10.1	ug/L
206-44-0	Fluoranthene		1	U	0.4	1	10.1	ug/L
129-00-0	Pyrene		1	U	0.2	1	10.1	ug/L
85-68-7	Butylbenzylphthalate		1	U	0.19	1	10.1	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate		10.7		0.16	1	10.1	ug/L
SURROGATES								
367-12-4	2-Fluorophenol		57.5		10 - 130		38%	SPK: 150
13127-88-3	Phenol-d6		36.1		10 - 130		24%	SPK: 150
4165-60-0	Nitrobenzene-d5		73.2		36 - 131		73%	SPK: 100
321-60-8	2-Fluorobiphenyl		77.8		39 - 131		78%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF066204.D	1	10/18/13	10/18/13	PB72943

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	110		25 - 155		73%	SPK: 150
1718-51-0	Terphenyl-d14	85.4		23 - 130		85%	SPK: 100

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	104773	5.15
1146-65-2	Naphthalene-d8	459564	6.4
15067-26-2	Acenaphthene-d10	246584	8.11
1517-22-2	Phenanthrene-d10	439766	9.56
1719-03-5	Chrysene-d12	350461	12.16
1520-96-3	Perylene-d12	333537	13.45

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	980 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL005872.D	1	10/18/13	10/18/13	PB72941

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.005	0.01	0.051	ug/L
319-85-7	beta-BHC	0.01	U	0.009	0.01	0.051	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.006	0.01	0.051	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.01	0.051	ug/L
309-00-2	Aldrin	0.01	U	0.006	0.01	0.051	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.007	0.01	0.051	ug/L
959-98-8	Endosulfan I	0.01	U	0.006	0.01	0.051	ug/L
60-57-1	Dieldrin	0.01	U	0.005	0.01	0.051	ug/L
72-55-9	4,4-DDE	0.01	U	0.005	0.01	0.051	ug/L
72-20-8	Endrin	0.01	U	0.006	0.01	0.051	ug/L
33213-65-9	Endosulfan II	0.01	U	0.006	0.01	0.051	ug/L
72-54-8	4,4-DDD	0.01	U	0.007	0.01	0.051	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.006	0.01	0.051	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.01	0.051	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.005	0.01	0.051	ug/L
8001-35-2	Toxaphene	0.102	U	0.102	0.102	0.51	ug/L
57-74-9	Chlordane	0.102	U	0.102	0.102	0.51	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	21.4		10 - 192		107%	SPK: 20
877-09-8	Tetrachloro-m-xylene	22		10 - 172		110%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	970 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PC015799.D	1	10/18/13	10/18/13	PB72940

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.103	U	0.099	0.103	0.515	ug/L
11104-28-2	Aroclor-1221	0.103	U	0.103	0.103	0.515	ug/L
11141-16-5	Aroclor-1232	0.103	U	0.103	0.103	0.515	ug/L
53469-21-9	Aroclor-1242	0.103	U	0.092	0.103	0.515	ug/L
12672-29-6	Aroclor-1248	0.103	U	0.103	0.103	0.515	ug/L
11097-69-1	Aroclor-1254	0.103	U	0.045	0.103	0.515	ug/L
11096-82-5	Aroclor-1260	0.103	U	0.084	0.103	0.515	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	11.9		35 - 137		60%	SPK: 20
2051-24-3	Decachlorobiphenyl	18.6		40 - 135		93%	SPK: 20

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LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	~~UN*~~ J	1	4.2	5.0	10	ug/L	10/18/13	10/18/13	SW6010
7440-43-9	Cadmium	7.99	~~N*~~ J	1	0.5	1.5	3	ug/L	10/18/13	10/18/13	SW6010
7440-47-3	Chromium	2.5	~~UN*~~ J	1	1.1	2.5	5	ug/L	10/18/13	10/18/13	SW6010
7440-50-8	Copper	4	~~JN*~~	1	2	5.0	10	ug/L	10/18/13	10/18/13	SW6010
7439-92-1	Lead	3	~~UN*~~ J	1	2.6	3.0	6	ug/L	10/18/13	10/18/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	10/18/13	10/21/13	SW7470A
7440-02-0	Nickel	652	~~N~~ J	1	4.2	10.0	20	ug/L	10/18/13	10/18/13	SW6010
7782-49-2	Selenium	8.71	~~JN*~~	1	4.8	5.0	10	ug/L	10/18/13	10/18/13	SW6010
7440-22-4	Silver	6.65	~~N*~~ J	1	1.5	2.5	5	ug/L	10/18/13	10/18/13	SW6010
7440-66-6	Zinc	1300		1	6.5	10.0	20	ug/L	10/18/13	10/18/13	SW6010

Color Before:	Yellow	Clarity Before:	Cloudy	Texture:	
Color After:	Yellow	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	10/17/13 12:30:00
Project:	ARC Horseshoe Road	Date Received:	10/17/13
Client Sample ID:	EFFLUENT006(101713)	SDG No.:	E4151
Lab Sample ID:	E4151-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	10/18/13	10/18/13 14:49	9012B
TOC	1.31		1	0.08	0.25	0.5	mg/L	10/18/13	10/18/13 12:24	SM5310B
TSS	4	U	1	4	4	4	mg/L	10/18/13	10/18/13 09:20	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. E4315
QUOTE NO.
COC Number 031034

12.1

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: Creamer Environmental
ADDRESS: 215 Union Street
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: Saverville
PROJECT MANAGER: Gary Kowalski
e-mail: GKowalski@creamerenvironmental.com
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 215 Union St
CITY: Hackensack STATE: NJ ZIP: 07601
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☒ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 PCB Gr. 1
2 Pest Gr. 1
3 SVOC-SIM Gr. 1
4 SVOCMS Gr. 3
5 TSS
6 VOCMS Gr. 3
7 METALS - ICP Gr. 1
8 TOC
9 CYANIDE
Field pH

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
								PRESERVATIVES									← Specify Preservatives A-HCl B-HNO_3 C-H_2SO_4 D-NaOH E-ICE F-Other
								E	E	E	E	E	A	B	C	D	
1.	Effluent 007 (110113)	Water		X	11/1	1230	10	X	X	X	X	X	X	X	X	X	
2.	Influent 007 (110113)	Water		X	11/1	1300	10	X	X	X	X	X	X	X	X	X	
3.	Field pH	Water		X	11/1	1500											PH. 6.35 - Temp. 23°
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	11/1/13 1510	1. [signature]
RELINQUISHED BY: 2. [signature]	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 11/1/13 1550	RECEIVED FOR LAB BY: 3. Sheila McGh

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
Cooler Temp. 5°C
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Ice in Cooler?: ✓

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
E4315

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN010183.D	1		11/05/13	VN110513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U J	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U J	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.8		61 - 141		92%	SPK: 50
1868-53-7	Dibromofluoromethane	44.7		69 - 133		89%	SPK: 50
2037-26-5	Toluene-d8	48.5		65 - 126		97%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN010183.D	1		11/05/13	VN110513

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	44.3		58 - 135		89%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	307114	7.87				
540-36-3	1,4-Difluorobenzene	466919	8.78				
3114-55-4	Chlorobenzene-d5	419995	11.61				
3855-82-1	1,4-Dichlorobenzene-d4	189612	13.56				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF066601.D	1	11/04/13	11/07/13	PB73205

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.54	1	10	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.26	1	10	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10	ug/L
67-72-1	Hexachloroethane	1	U	0.25	1	10	ug/L
78-59-1	Isophorone	1	U	0.3	1	10	ug/L
88-75-5	2-Nitrophenol	1	U	0.52	1	10	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.56	1	10	ug/L
131-11-3	Dimethylphthalate	2.3	J	0.22	1	10	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.32	1	10	ug/L
100-02-7	4-Nitrophenol	5	U	2	5	10	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10	ug/L
84-66-2	Diethylphthalate	1	U	0.38	1	10	ug/L
86-73-7	Fluorene	1	U	0.31	1	10	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.74	2	10	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.6	1	10	ug/L
85-01-8	Phenanthrene	1	U	0.26	1	10	ug/L
120-12-7	Anthracene	1	U	0.16	1	10	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10	ug/L
206-44-0	Fluoranthene	1	U	0.4	1	10	ug/L
129-00-0	Pyrene	1	U	0.2	1	10	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	51.6		10 - 130		34%	SPK: 150
13127-88-3	Phenol-d6	32.9		10 - 130		22%	SPK: 150
4165-60-0	Nitrobenzene-d5	69.1		36 - 131		69%	SPK: 100
321-60-8	2-Fluorobiphenyl	88.3		39 - 131		88%	SPK: 100

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Report of Analysis

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Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF066601.D	1	11/04/13	11/07/13	PB73205

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	120		25 - 155		82%	SPK: 150
1718-51-0	Terphenyl-d14	84.4		23 - 130		84%	SPK: 100

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	119202	4.78
1146-65-2	Naphthalene-d8	492199	6.05
15067-26-2	Acenaphthene-d10	264070	7.75
1517-22-2	Phenanthrene-d10	488611	9.19
1719-03-5	Chrysene-d12	413334	11.77
1520-96-3	Perylene-d12	388581	13.05

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083686.D	1	11/04/13	11/06/13	PB73227

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U J	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U J	0.02	1.3	2.5	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.25	U	0.02	0.25	0.5	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.02	J	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	63		10 - 160		42%	SPK: 150
13127-88-3	Phenol-d6	26.2		10 - 160		17%	SPK: 150
4165-60-0	Nitrobenzene-d5	22.1		20 - 139		22%	SPK: 100
321-60-8	2-Fluorobiphenyl	65		10 - 173		65%	SPK: 100
118-79-6	2,4,6-Tribromophenol	57.1		10 - 169		38%	SPK: 150
1718-51-0	Terphenyl-d14	72.8		20 - 171		73%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	126587	7				
1146-65-2	Naphthalene-d8	470278	8.95				
15067-26-2	Acenaphthene-d10	254114	11.74				
1517-22-2	Phenanthrene-d10	490196	14.12				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE083686.D	1	11/04/13	11/06/13	PB73227

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	382930	18.4				
1520-96-3	Perylene-d12	289498	20.52				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	990 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL006060.D	1	11/04/13	11/05/13	PB73229

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.005	0.01	0.051	ug/L
319-85-7	beta-BHC	0.01	U	0.009	0.01	0.051	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.006	0.01	0.051	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.01	0.051	ug/L
309-00-2	Aldrin	0.01	U	0.006	0.01	0.051	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.007	0.01	0.051	ug/L
959-98-8	Endosulfan I	0.01	U	0.006	0.01	0.051	ug/L
60-57-1	Dieldrin	0.01	U	0.005	0.01	0.051	ug/L
72-55-9	4,4-DDE	0.01	U	0.005	0.01	0.051	ug/L
72-20-8	Endrin	0.01	U	0.006	0.01	0.051	ug/L
33213-65-9	Endosulfan II	0.01	U	0.006	0.01	0.051	ug/L
72-54-8	4,4-DDD	0.01	U	0.007	0.01	0.051	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.006	0.01	0.051	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.01	0.051	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.005	0.01	0.051	ug/L
8001-35-2	Toxaphene	0.101	U	0.101	0.101	0.505	ug/L
57-74-9	Chlordane	0.101	U	0.101	0.101	0.505	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	16.1		10 - 192		81%	SPK: 20
877-09-8	Tetrachloro-m-xylene	20.1		10 - 172		100%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

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Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB008168.D	1	11/04/13	11/07/13	PB73228

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.1	U	0.096	0.1	0.5	ug/L
11104-28-2	Aroclor-1221	0.1	U	0.1	0.1	0.5	ug/L
11141-16-5	Aroclor-1232	0.1	U	0.1	0.1	0.5	ug/L
53469-21-9	Aroclor-1242	0.1	U	0.089	0.1	0.5	ug/L
12672-29-6	Aroclor-1248	0.1	U	0.1	0.1	0.5	ug/L
11097-69-1	Aroclor-1254	0.1	U	0.044	0.1	0.5	ug/L
11096-82-5	Aroclor-1260	0.1	U	0.081	0.1	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18.1		35 - 137		91%	SPK: 20
2051-24-3	Decachlorobiphenyl	15.4		40 - 135		77%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U~~N~~	1	4.2	5.0	10	ug/L	11/04/13	11/04/13	SW6010
7440-43-9	Cadmium	0.805	J	1	0.5	1.5	3	ug/L	11/04/13	11/04/13	SW6010
7440-47-3	Chromium	2.5	U	1	1.1	2.5	5	ug/L	11/04/13	11/04/13	SW6010
7440-50-8	Copper	9.92	J	1	2	5.0	10	ug/L	11/04/13	11/04/13	SW6010
7439-92-1	Lead	3	U~~N~~	1	2.6	3.0	6	ug/L	11/04/13	11/04/13	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	11/05/13	11/06/13	SW7470A
7440-02-0	Nickel	257		1	4.2	10.0	20	ug/L	11/04/13	11/04/13	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	11/04/13	11/04/13	SW6010
7440-22-4	Silver	7.9	~~N~~	1	1.5	2.5	5	ug/L	11/04/13	11/04/13	SW6010
7440-66-6	Zinc	429	~~*~~	1	6.5	10.0	20	ug/L	11/04/13	11/04/13	SW6010

Color Before:	Yellow	Clarity Before:	Clear	Texture:	
Color After:	Yellow	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	11/01/13 12:30:00
Project:	ARC Horseshoe Road	Date Received:	11/01/13
Client Sample ID:	EFFLUENT007(110113)	SDG No.:	E4315
Lab Sample ID:	E4315-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	11/05/13	11/06/13 14:09	9012B
TOC	4.32		1	0.08	0.25	0.5	mg/L	11/12/13	11/12/13 11:11	SM5310B
TSS	4	U	1	4	4	4	mg/L	11/04/13	11/04/13 10:53	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

Imagine the result

Atlantic Resources Corporation (ARC) Superfund Site

Data Review

SAYREVILLE, NEW JERSEY

Volatile, Semivolatile, Pesticide, PCB, Herbicide,
Metals and Miscellaneous Analyses

SDG#F1014, F1362, and F1599

Analyses Performed By:
Chemtech
Mountainside, NJ

Report: #21740R
Review Level: Tier III
Project: NJ000514.0007.00002

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # F1014, F1362, and F1599 for samples collected in association with the Atlantic Resources Corporation (ARC) Superfund Site. The review was conducted as a Tier III 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:

SDG Number	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis				
						VOC	SVOC	PCB/ PEST	MET	MISC
F1014	EFFLUENT008(010614)	F1014-01	Water	1/06/2014		X	X	X	X	X
F1362	EFFLUENT09(020614)	F1362-02	Water	2/06/2014		X	X	X	X	X
F1599	EFFLUENT10(031014)	F1599-02	Water	3/10/2014		X	X	X	X	X

Note:

1. Miscellaneous analyses include cyanide, TSS, and TOC.
2. Samples INFLUENT008(010614), INFLUENT006(020614) and INFLUENT007(031014) were not evaluated in this 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	

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 8260C, 8270D/8270D-SIM, 8081B, 8151A, and 8082A. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

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 had already been 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 USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The compound was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

  JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

  UB Compound considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected as unusable. The compound 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.

VOLATILE ORGANIC COMPOUND (VOC) 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 8260C	Soil	48 hours from collection to extraction and 14 days from collection to analysis	Cool to <6°C
	Water	14 days from collection to analysis	Cool to <6°C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks, trip blanks, and equipment 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. Trip blanks measure sample storage contamination. Rinse blanks also 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 (common laboratory contaminant compounds are calculated at ten times) 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.

Target compounds were detected in the associated QA blanks; however, the associated sample results were non-detect. Therefore, qualification of the sample results was not required.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99, and a RRF value greater than control limit (0.05).

4.2 Continuing Calibration (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
EFFLUENT09(020614)	Continuing %D	Vinyl chloride	68.1%
		Chloroethane	60.1%
EFFLUENT10(031014)	Continuing %D	Acrylonitrile	26.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. VOC analysis requires that all surrogates associated with the analysis exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard area counts were within the control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The spiked compounds used in the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSDs performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD spiking concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR VOCs

VOCs: SW-846 8260B	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
C. Trip blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD Precision RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

SEMIVOLATILE ORGANIC COMPOUND (SVOC) 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 8270D/8270D-SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C °C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 (common laboratory contaminant compounds are calculated at ten times) 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.

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

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution are acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration Verification (CCV)

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Location	Initial/ Continuing	Compound	Criteria
EFFLUENT09(020614)	Continuing %D	4-Nitrophenol	27.2%
		2,4-Dinitrotoluene	21.3%
		4,6-Dinitro-2-methylphenol	30.1%
		Butylbenzylphthalate	39.1%
		Bis(2-ethylhexyl)phthalate	31.5%
EFFLUENT09(020614)	Continuing %D	2,4-Dichlorophenol	-20.6%
		2,4-Dinitrophenol	-69.5%
		Pentachlorophenol	-40.9%
EFFLUENT10(031014)	Continuing %D	Phenol (SIM)	25.7%
		Nitrobenzene (SIM)	23.1%
		2,4-Dinitrophenol (SIM)	-43.8%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. SVOC analysis requires that two of the three SVOC surrogate compounds within each fraction exhibit recoveries within the laboratory-established acceptance limits, and that all SVOC surrogate recoveries be greater than ten percent.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Surrogate	Recovery
EFFLUENT09(020614) (SIM)	Phenol-d6	<10%
	2-Fluorophenol	AC
	2,4,6-Tribromophenol	AC
	Nitrobenzene-d5	AC
	2-Fluorobiphenyl	AC
	Terphenyl-d14	AC

UL Upper control limit

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results associated with the deviant fraction are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> UL	Non-detect	No Action
	Detect	J
< LL but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the SVOC analysis exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

Sample locations associated with internal standards exhibiting responses outside of the control limits are presented in the following table.

Sample Locations	Internal Standard	Response
EFFLUENT10(031014)	Perylene-d12	< LL but > 25%

AC Acceptable

The criteria used to evaluate the internal standard responses are presented in the following table. In the case of an internal standard deviation, the compounds quantitated under the deviant internal standard are qualified as documented in the table below.

Control limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No action
	Detect	J
< the lower control limit (LL) but > 25%	Non-detect	UJ
	Detect	J
< 25%	Non-detect	R
	Detect	J

No target compounds were associated with the failing internal standard.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD results must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits.

Sample locations associated with LCS/LCSD analysis exhibiting recoveries outside of the control limits presented in the following table.

Sample Locations	Compound	LCS Recovery	LCSD Recovery
EFFLUENT008(010614)	Hexachlorocyclopentadiene	>UL	-
EFFLUENT09(020614)	Benzidine (SIM)	>UL	>UL

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

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J
< 10%	Non-detect	R
	Detect	J

Sample locations associated with LCS/LCSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
EFFLUENT10(031014)	2,4-Dinitrophenol (SIM)

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

Control Limit	Sample Result	Qualification
> UL	Non-detect	UJ
	Detect	J

9. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

11. 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 VALIDATION CHECKLIST FOR SVOCs

SVOCs: SW-846 8270D	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding Times		X		X	
Reporting Limits (units)		X		X	
Blanks					
A. Method Blanks		X		X	
B. Equipment/Field Blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X	X		
LCS/LCSD Precision (RPD)		X	X		
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
System Performance and Column Resolution		X		X	
Initial Calibration %RSDs		X		X	
Continuing Calibration RRFs		X		X	
Continuing Calibration %Ds		X	X		
Instrument Tune and Performance Check		X		X	
Ion Abundance Criteria for Each Instrument Used		X		X	
Internal Standards		X		X	
Compound Identification and Quantitation					
A. Reconstructed Ion Chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of Sample Compounds Within the Established RT Windows		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting Limits Adjusted for Sample Dilutions		X		X	

%R Percent Recovery
RPD Relative Percent Difference
%RSD Relative Standard Deviation
%D Percent Difference

PESTICIDES 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 8081A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool @ <6°C

All samples were extracted and analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration Verification (ICV)

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99.

4.2 Continuing Calibration Verification (CCV)

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the method-specified control limit of 15%.

All compounds associated with calibrations were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic analytes are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. pesticide analysis requires that at least one of the two surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The analytes used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the analyte concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS analysis must exhibit recoveries within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices and 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 ten times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected compound results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PESTICIDES

Pesticides: SW-846 8081A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Laboratory Duplicate Sample RPD					X
Field Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column %D $\leq$ 40% (If dual column is performed for reporting-not confirmation)		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Analyte identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample analytes within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference

POLYCHLORINATED BIPHENYLS (PCBs) 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 8082A	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C
	Soil	14 days from collection to extraction and 40 days from extraction to analysis	Cool to <6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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.

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

3. System Performance

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

All target analytes associated with the initial calibration standards must exhibit a relative standard deviation (RSD) less than the method-specified control limit of 20% or a correlation coefficient greater than 0.99. Multiple-point calibrations were performed for Aroclor 1016 and 1260 only. Single-point calibrations were performed for the remaining Aroclors.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All calibration criteria were within the control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. PCB analysis requires that at least one of the two PCB surrogate compounds exhibit recoveries within the laboratory-established acceptance limits.

All surrogate recoveries were within the control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS and MSD must be within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater. Sample results associated with MS/MSD exceedances where the parent samples are not site-specific are not qualified.

The MS/MSD analysis was not performed on a sample location within this SDG.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The spiked compounds used in the LCS/LCSD analysis must exhibit recoveries within the laboratory-established acceptance limits. The relative percent difference (RPD) between the LCS and LCSD results must be within the laboratory-established acceptance limits.

All compounds associated with the LCS/LCSD analyses exhibited recoveries and RPDs within the control limits.

8. Field Duplicate Sample Analysis

Field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

9. Analyte Identification

The retention times of all quantitated peaks must fall within the calculated retention time windows for both the primary and confirmation columns. When dual column analysis is performed the relative percent difference (RPD) between the detected analyte results calculated on each column must be less than 40%.

All sample results exhibited acceptable RPDs between the primary and confirmation columns.

10. 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 VALIDATION CHECKLIST FOR PCBs

PCBs: SW-846 8082A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY (GC/ECD)					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment/Field blanks					X
Laboratory Control Sample (LCS) Accuracy %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R					X
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD					X
Surrogate Spike %R		X		X	
Column (%D) (If dual column is performed-not confirmation purposes only)		X		X	
Dilution Factor		X		X	
Moisture Content					X
Tier III Validation					
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
System performance and column resolution		X		X	
Compound identification and quantitation					
A. Quantitation Reports		X		X	
B. RT of sample compounds within the established RT windows		X		X	
C. Identification/Confirmation		X		X	
D. Quantitation transcriptions/calculations		X		X	
E. Reporting limits adjusted for sample dilutions		X		X	

%R Percent recovery
RPD Relative percent difference
%RSD Relative standard deviation
%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to (United States Environmental Protection Agency) SW-846 Methods 6010B, 7470A, 9012B, SM4500, SM5310, and SM2540. Data were reviewed in accordance with USEPA National Functional Guidelines of July 2002.

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 contract-required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).

- Quantitation (Q) Qualifiers

  E The reported value is estimated due to the presence of interference.

  N Spiked sample recovery is not within the control limits.

  * Duplicate analysis is not within the control limits.

- Validation Qualifiers

  J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

  UJ The analyte was not detected above the reported sample detection 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 sample results are rejected as unusable. 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.

METALS 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 6010B	Water	180 days from collection to analysis	Cool to <6°C; pH < 2 with HNO_3
	Soil	180 days from collection to analysis	Cool to <6°C
SW-846 7470A	Water	28 days from collection to analysis	Cool to <6°C pH < 2 with HNO_3
SW-846 7471B	Soil	28 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. laboratory method blanks and equipment 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 also measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected analyte in an associated blank (common laboratory contaminant analytes are calculated at ten times) 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.

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

3. Calibration

Satisfactory instrument calibration is established to provide that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument's continuing performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (10%).

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 for all non-ICP analytes and all initial calibration verification standard recoveries were within the control limits.

All initial and continuing calibration verification standard recoveries were within the control limits.

3.3 Reporting limit (RL) Check Standard

The RL check standard serves to verify the linearity of calibration of the analysis at the RL. The RL standard is not required for the analysis of aluminum (Al), barium (Ba), calcium (Ca), iron (Fe), magnesium (Mg), sodium (Na), and potassium (K). The criteria used to evaluate the RL standard analysis are presented below in the RL standards evaluation table.

All RL standard recoveries were within the control limits.

3.4 ICP Interference Check Standard (ICS)

The ICS verifies the laboratories inter-element and background correction factors.

All ICS exhibited recoveries within the control limits.

4. Matrix Spike (MS) and Laboratory Duplicate Sample Analysis

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

4.1 MS Analysis

All metal analytes must exhibit recoveries within the established acceptance limits of 75% to 125%. The MS control limits do not apply for MSs performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS spiking concentration by a factor of four or greater. In instance where this is true, the data will not be qualified and the laboratory qualifier "N" will be removed. Sample results associated with MS exceedances where the parent samples are not site-specific are not qualified.

All analytes associated with MS/MSD recoveries were within control limits with the exception of the following analyte present in the table below.

Sample Location	Analyte	MS Recovery	MSD Recovery
EFFLUENT008(010614)	Silver	53%	51.7%

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.

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

Note: The MS/MSD was not performed on associated samples in SDGs F1362 or F1599. The laboratory qualifiers will be removed.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five 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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The MS/MSD was performed in addition to the laboratory duplicate analysis. The MS/MSD and laboratory duplicate RPDs exhibited acceptable recoveries.

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 recoveries between the control limits of 80% and 120%.

The LCS analyses exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the RL, a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

7. Serial Dilution

The serial dilution analysis is used to assess if a significant physical or chemical interference exists due to sample matrix. Analytes exhibiting concentrations greater than 50 times the MDL in the undiluted sample are evaluated to determine if matrix interference exists. These analytes are required to have less than a 10% difference (%D) between sample results from the undiluted (parent) sample and results associated with the same sample analyzed with a five-fold dilution.

The serial dilution analysis was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR METALS

METALS: SW-846 6010C and 7470A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP) Atomic Absorption – Manual Cold Vapor (CV)					
Tier II Validation					
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
Laboratory Control Sample (LCS)		X		X	
Matrix Spike (MS) Accuracy (%R)		X	X		
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field/Laboratory Duplicate Sample RPD		X		X	
ICP Serial Dilution		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial Calibration Verification		X		X	
Continuing Calibration Verification		X		X	
RL Standard		X		X	
ICP Interference Check		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

%R – Percent recovery
RPD – Relative percent difference

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
Cyanide by SW-846 9012	Water	14 days from collection to analysis	Cool to <6 °C; preserved to a pH of greater than 12.
Total Suspended Solids By SM2540	Water	7 days from collection to analysis	Cool to <6 °C.
Total Organic Carbon (TOC) by SM5310B	Water	28 days from collection to analysis	Cool to <6 °C; preserved to a pH of less than 2.

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e. laboratory method blanks and equipment 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 analyte 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.

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

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The initial calibration must exhibit a correlation coefficient greater than 0.995. A technical review of the data applies limits to all analytes with no exceptions.

3.2 Continuing Calibration

All target analytes associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (15%).

All analytes associated with the initial and continuing calibrations were within the specified control limits. The correct frequency and type of standards were analyzed.

4. Matrix Spike (MS) / Laboratory Duplicate Analyses

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

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS 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 qualifier "N" will be removed.

Sample locations EFFLUENT008(010614) and EFFLUENT10(031014) were used in the MS analysis. All analytes associated with the MS analyses exhibited acceptable recoveries.

4.2 Laboratory Duplicate Sample Analysis

The laboratory duplicate sample relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to five times the reporting limit (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 five times the RL, a control limit of one times the RL is applied for water matrices and two times the RL for soil matrices.

The laboratory duplicate sample results exhibited RPD within the control limit.

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 recoveries between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

6. Field Duplicate Sample Analysis

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 50% for water matrices and 100% 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 five times the reporting limit (RL), a control limit of two times the RL is applied for water matrices or three times the RL is applied for soil matrices.

Field duplicate samples were not collected as part of this dataset.

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 VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: EPA Lloyd-Kahn	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Tier II Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks					X
Laboratory Control Sample (LCS) Accuracy (%R)		X		X	
Laboratory Control Sample Duplicate (LCSD) %R					X
LCS/LCSD Precision (RPD)					X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R					X
MS/MSD RPD					X
Field/Laboratory Duplicate Sample RPD		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Tier III Validation					
Initial calibration %RSD or correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Quantitation transcriptions/calculations		X		X	
Reporting limits adjusted for sample dilutions		X		X	

%RSD – relative standard deviation
%R – percent recovery
RPD – relative percent difference
%D – difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE: _____

DATE: June 2, 2014

PEER REVIEW: Dennis Capria

DATE: June 12, 2014

CHAIN OF CUSTODY/
CORRECTED SAMPLE ANALYSIS DATA SHEETS

CHEMTECH

CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. F1014
QUOTE NO.
COC Number 028023

12.1

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: Creamer Environmental
ADDRESS: 12 OldBridge RD
CITY: CEDAR Grove STATE: NJ ZIP: 07009
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYERVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: G.Kowalski@creamerenvironmental.com
PHONE: 201-441-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 12 old Bridge Road
CITY: CEDAR Grove STATE: NJ ZIP: 07009
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: 3 DAY DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☒ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 PCB Gr.1
2 PEST Gr.1
3 SVOC-SIM Gr.1
4 SVOCMS Gr.3
5 TSS
6 VOCMS Gr.3
7 METALS-1(Pcr.1
8 TOC
9 CYANIDE
~~pH~~

PRESERVATIVES

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
								E	E	E	E	E	A	B	C	D	
1.	EFFLUENT 008 (010614)	WATER		X	1/6	1030	10	X	X	X	X	X	X	X	X	X	
2.	INFLUENT 008 (010614)	WATER		X	1/6	1045	10	X	X	X	X	X	X	X	X	X	
~~3.~~	~~Field pH~~	~~WATER~~		~~X~~	~~1/6~~	~~1050~~											
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME: 1341 1/6/14	RECEIVED BY: 1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 1650 1-6-14	RECEIVED FOR LAB BY: 3. CW

Conditions of bottles or coolers at receipt: ☑ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°C
Ice in Cooler?: yes

Page _____ of _____

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☑ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

SAMPLING LOGBOOK

Client Name: Creamer Environmental
Client Address: 400 Bayreville Horseshoe Road
Client Rep on Site:
Arrival time: 1:26 pm
Sampling Date: 1.6.14

1/10/14

Project Name: ARC Horseshoe RD
Project Location: Sayreville
Cooler Custody Seal: N/2
Departure Time: 1348

FIELD EQUIPMENT CALIBRATION

pH calibration						Specific Conductance (umho)/Salinity	Dissolved Oxygen (mg/L)
Standardization				Check			
	4.00 Buffer	7.00 Buffer	10.00 Buffer	7.00 Buffer	Calibration Solution		
Time	12:40	12:42	12:44	12:46	Reading(mS/cm)		
Temp °C	18.5	18.5	18.5	18.5	Temperature °C		
pH	4.00	7.01	10.06	7.01			

FIELD SAMPLING INFORMATION

Sampling Location	Date/time of sampling	Field Measurements				
		Date/time of Analysis	pH	Temperature °C	Specific Conductance (umho)/ Salinity	Dissolved Oxygen (mg/L)
Effluent 008	1.6.14 10:50am	1.6.14 1340	6.29	18.4	N/2	N/2

Meter: OAKTON pH/CON 10 serial# 128336 model No. WD-35630-62

Sampler Signature/ Date: [signature] 1.6.14

Supervisor Review/Date: CW 1-6-14

QA Control # A3041012

QA Control # A3041012

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN012015.D	1		01/08/14	VN010714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	1.2		0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.8		61 - 141		92%	SPK: 50
1868-53-7	Dibromofluoromethane	47.8		69 - 133		96%	SPK: 50
2037-26-5	Toluene-d8	48		65 - 126		96%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN012015.D	1		01/08/14	VN010714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	43.2		58 - 135		86%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	664953	7.86				
540-36-3	1,4-Difluorobenzene	1007270	8.78				
3114-55-4	Chlorobenzene-d5	892717	11.61				
3855-82-1	1,4-Dichlorobenzene-d4	397942	13.56				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF067898.D	1	01/07/14	01/07/14	PB74300

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.54	1	10	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.26	1	10	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10	ug/L
67-72-1	Hexachloroethane	1	U	0.25	1	10	ug/L
78-59-1	Isophorone	1	U	0.3	1	10	ug/L
88-75-5	2-Nitrophenol	1	U	0.52	1	10	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10	ug/L
77-47-4	Hexachlorocyclopentadiene	1	UQ	0.24	1	10	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.56	1	10	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.32	1	10	ug/L
100-02-7	4-Nitrophenol	5	U	2	5	10	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10	ug/L
84-66-2	Diethylphthalate	1	U	0.38	1	10	ug/L
86-73-7	Fluorene	1	U	0.31	1	10	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.74	2	10	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.6	1	10	ug/L
85-01-8	Phenanthrene	1	U	0.26	1	10	ug/L
120-12-7	Anthracene	1	U	0.16	1	10	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10	ug/L
206-44-0	Fluoranthene	1	U	0.4	1	10	ug/L
129-00-0	Pyrene	1	U	0.2	1	10	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	68.3		10 - 130		46%	SPK: 150
13127-88-3	Phenol-d6	42.7		10 - 130		28%	SPK: 150
4165-60-0	Nitrobenzene-d5	100		36 - 131		101%	SPK: 100
321-60-8	2-Fluorobiphenyl	110		39 - 131		110%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF067898.D	1	01/07/14	01/07/14	PB74300

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	230		25 - 155		151%	SPK: 150
1718-51-0	Terphenyl-d14	110		23 - 130		112%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	101188	6.92				
1146-65-2	Naphthalene-d8	404479	8.22				
15067-26-2	Acenaphthene-d10	210179	9.97				
1517-22-2	Phenanthrene-d10	414121	11.47				
1719-03-5	Chrysene-d12	462357	14.27				
1520-96-3	Perylene-d12	442562	16.04				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084432.D	1	01/07/14	01/09/14	PB74296

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.5	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	1.8		0.02	0.25	0.5	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.41		0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.02	J	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.76		0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.43		0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.73		0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.43		0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.77		0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	2.8		10 - 160		19%	SPK: 15
13127-88-3	Phenol-d6	1.8		10 - 160		12%	SPK: 15
4165-60-0	Nitrobenzene-d5	4.2		20 - 139		42%	SPK: 10
321-60-8	2-Fluorobiphenyl	5.2		10 - 173		52%	SPK: 10
118-79-6	2,4,6-Tribromophenol	9.1		10 - 169		61%	SPK: 15
1718-51-0	Terphenyl-d14	10.6		20 - 171		106%	SPK: 10
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	30322	5.74				
1146-65-2	Naphthalene-d8	135079	8.22				
15067-26-2	Acenaphthene-d10	76029	11.93				
1517-22-2	Phenanthrene-d10	134203	15.12				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084432.D	1	01/07/14	01/09/14	PB74296

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	133219	20.85				
1520-96-3	Perylene-d12	121636	23.39				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)RE	SDG No.:	F1014
Lab Sample ID:	F1014-01RE	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084456.D	1	01/07/14	01/10/14	PB74296

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	U	0.02	1.3	2.5	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.25	U	0.02	0.25	0.5	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.02	J	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.25		0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	2.5		10 - 160		17%	SPK: 15
13127-88-3	Phenol-d6	1.6		10 - 160		10%	SPK: 15
4165-60-0	Nitrobenzene-d5	3.5		20 - 139		35%	SPK: 10
321-60-8	2-Fluorobiphenyl	5.2		10 - 173		52%	SPK: 10
118-79-6	2,4,6-Tribromophenol	9.1		10 - 169		61%	SPK: 15
1718-51-0	Terphenyl-d14	9.5		20 - 171		95%	SPK: 10
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	56635	5.74				
1146-65-2	Naphthalene-d8	246240	8.22				
15067-26-2	Acenaphthene-d10	137130	11.93				
1517-22-2	Phenanthrene-d10	236018	15.12				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)RE	SDG No.:	F1014
Lab Sample ID:	F1014-01RE	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084456.D	1	01/07/14	01/10/14	PB74296

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	238252	20.84				
1520-96-3	Perylene-d12	208578	23.38				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL006757.D	1	01/07/14	01/07/14	PB74302

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.005	0.01	0.05	ug/L
319-85-7	beta-BHC	0.01	U	0.009	0.01	0.05	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.006	0.01	0.05	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.01	0.05	ug/L
309-00-2	Aldrin	0.01	U	0.006	0.01	0.05	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.007	0.01	0.05	ug/L
959-98-8	Endosulfan I	0.01	U	0.006	0.01	0.05	ug/L
60-57-1	Dieldrin	0.01	U	0.005	0.01	0.05	ug/L
72-55-9	4,4-DDE	0.01	U	0.005	0.01	0.05	ug/L
72-20-8	Endrin	0.01	U	0.006	0.01	0.05	ug/L
33213-65-9	Endosulfan II	0.01	U	0.006	0.01	0.05	ug/L
72-54-8	4,4-DDD	0.01	U	0.007	0.01	0.05	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.006	0.01	0.05	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.01	0.05	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.005	0.01	0.05	ug/L
8001-35-2	Toxaphene	0.1	U	0.1	0.1	0.5	ug/L
57-74-9	Chlordane	0.1	U	0.1	0.1	0.5	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	20.6		10 - 192		103%	SPK: 20
877-09-8	Tetrachloro-m-xylene	21.5		10 - 172		108%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB009056.D	1	01/07/14	01/08/14	PB74297

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.1	U	0.096	0.1	0.5	ug/L
11104-28-2	Aroclor-1221	0.1	U	0.1	0.1	0.5	ug/L
11141-16-5	Aroclor-1232	0.1	U	0.1	0.1	0.5	ug/L
53469-21-9	Aroclor-1242	0.1	U	0.089	0.1	0.5	ug/L
12672-29-6	Aroclor-1248	0.1	U	0.1	0.1	0.5	ug/L
11097-69-1	Aroclor-1254	0.1	U	0.044	0.1	0.5	ug/L
11096-82-5	Aroclor-1260	0.1	U	0.081	0.1	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	21.9		35 - 137		109%	SPK: 20
2051-24-3	Decachlorobiphenyl	21.5		40 - 135		107%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U	1	4.2	5.0	10	ug/L	01/07/14	01/07/14	SW6010
7440-43-9	Cadmium	1.5	U	1	0.5	1.5	3	ug/L	01/07/14	01/07/14	SW6010
7440-47-3	Chromium	17		1	1.1	2.5	5	ug/L	01/07/14	01/07/14	SW6010
7440-50-8	Copper	4.13	J	1	2	5.0	10	ug/L	01/07/14	01/07/14	SW6010
7439-92-1	Lead	3	U	1	2.6	3.0	6	ug/L	01/07/14	01/07/14	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	01/07/14	01/08/14	SW7470A
7440-02-0	Nickel	17.6	J	1	4.2	10.0	20	ug/L	01/07/14	01/07/14	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	01/07/14	01/07/14	SW6010
7440-22-4	Silver	2.5	~~UN~~ J	1	1.5	2.5	5	ug/L	01/07/14	01/07/14	SW6010
7440-66-6	Zinc	25.9		1	6.5	10.0	20	ug/L	01/07/14	01/07/14	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14 10:30:00
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008(010614)	SDG No.:	F1014
Lab Sample ID:	F1014-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	01/08/14	01/08/14 12:06	9012B
TOC	6.12		1	0.08	0.25	0.5	mg/L	01/07/14	01/07/14 11:38	SM5310B
TSS	4	U	1	4	4	4	mg/L	01/07/14	01/07/14 12:15	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	01/06/14 10:50
Project:	ARC Horseshoe Road	Date Received:	01/06/14
Client Sample ID:	EFFLUENT008	SDG No.:	F1014
Lab Sample ID:	F1014-03	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Field pH	6.29		1	0	0	0	pH	01/06/14	01/06/14 10:50	SM4500-H B

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH

CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. F1362
QUOTE NO.
COC Number 028682

10.1

CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: Creamer Environmental INC
ADDRESS: 12 Old Bridge RD
CITY: CEDAR GROVE STATE: NJ ZIP: 07009
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION

PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: SAYREVILLE
PROJECT MANAGER: Gary Kowalski
e-mail: G.Kowalski@creamerenvironmental.com
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION

BILL TO: Creamer Environmental PO#:
ADDRESS: 12 Old BRIDGE RD
CITY: CEDAR GROVE STATE: NJ ZIP: 07009
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 PCB G.1
2 PEST G.1
3 SVOC-SIM G.1
4 SVOC MS G.3
5 TSS
6 VOCMS G.3
7 METALS-ICP G.1
8 TOC
9 CYANIDE
PH

PRESERVATIVES

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 E	2 E	3 E	4 E	5 E	6 A	7 B	8 C	9 D	COMMENTS
1.	EFFLUENT 09(020614)			X	2/6	1100	10	X	X	X	X	X	X	X	X	X	
2.	Field pH				2/7	0800	1										PH 6.70
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1. [signature]	0950 2/6/14	1. [signature]
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3. [signature]	DATE/TIME: 1330 2.7.14	RECEIVED FOR LAB BY: 3. [signature]

Conditions of bottles or coolers at receipt: ☑ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:

Cooler Temp. 5°
Ice in Cooler?: Yes

Page 1 of 1

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☑ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☑ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN012785.D	1		02/08/14	VN020714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	42.1		61 - 141		84%	SPK: 50
1868-53-7	Dibromofluoromethane	47.8		69 - 133		96%	SPK: 50
2037-26-5	Toluene-d8	49.2		65 - 126		98%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN012785.D	1		02/08/14	VN020714

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	43.9		58 - 135		88%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	443598	7.864				
540-36-3	1,4-Difluorobenzene	623714	8.783				
3114-55-4	Chlorobenzene-d5	546958	11.606				
3855-82-1	1,4-Dichlorobenzene-d4	238779	13.558				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF068666.D	1	02/07/14	02/10/14	PB74945

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.54	1	10	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.26	1	10	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10	ug/L
67-72-1	Hexachloroethane	1	U	0.25	1	10	ug/L
78-59-1	Isophorone	1	U	0.3	1	10	ug/L
88-75-5	2-Nitrophenol	1	U	0.52	1	10	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.56	1	10	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.32	1	10	ug/L
100-02-7	4-Nitrophenol	5	U	2	5	10	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10	ug/L
84-66-2	Diethylphthalate	1	U	0.38	1	10	ug/L
86-73-7	Fluorene	1	U	0.31	1	10	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.74	2	10	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.6	1	10	ug/L
85-01-8	Phenanthrene	1	U	0.26	1	10	ug/L
120-12-7	Anthracene	1	U	0.16	1	10	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10	ug/L
206-44-0	Fluoranthene	1	U	0.4	1	10	ug/L
129-00-0	Pyrene	1	U	0.2	1	10	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	37.2		10 - 130		25%	SPK: 150
13127-88-3	Phenol-d6	23.3		10 - 130		16%	SPK: 150
4165-60-0	Nitrobenzene-d5	60.7		36 - 131		61%	SPK: 100
321-60-8	2-Fluorobiphenyl	58.4		39 - 131		58%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	1000 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF068666.D	1	02/07/14	02/10/14	PB74945

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	90.5		25 - 155		60%	SPK: 150
1718-51-0	Terphenyl-d14	62.4		23 - 130		62%	SPK: 100

INTERNAL STANDARDS

3855-82-1	1,4-Dichlorobenzene-d4	128659	7.07
1146-65-2	Naphthalene-d8	555749	8.65
15067-26-2	Acenaphthene-d10	269662	10.81
1517-22-2	Phenanthrene-d10	435931	12.63
1719-03-5	Chrysene-d12	430221	15.87
1520-96-3	Perylene-d12	406185	17.49

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	900 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084755.D	1	02/07/14	02/10/14	PB74946

CAS Number	Parameter		Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS								
62-75-9	n-Nitrosodimethylamine		0.06	U	0.02	0.06	0.11	ug/L
108-95-2	Phenol	R	~~0.06~~	~~U~~	~~0.02~~	~~0.06~~	~~0.11~~	~~ug/L~~
111-44-4	bis(2-Chloroethyl)ether		0.06	U	0.02	0.06	0.11	ug/L
98-95-3	Nitrobenzene		0.06	U	0.02	0.06	0.11	ug/L
105-67-9	2,4-Dimethylphenol	R	~~0.06~~	~~U~~	~~0.02~~	~~0.06~~	~~0.11~~	~~ug/L~~
120-83-2	2,4-Dichlorophenol	R	~~0.06~~	~~U~~	~~0.02~~	~~0.06~~	~~0.11~~	~~ug/L~~
87-68-3	Hexachlorobutadiene		0.06	U	0.02	0.06	0.11	ug/L
51-28-5	2,4-Dinitrophenol	R	~~1.4~~	~~U~~	~~0.02~~	~~1.4~~	~~2.8~~	~~ug/L~~
118-74-1	Hexachlorobenzene		0.06	U	0.02	0.06	0.11	ug/L
87-86-5	Pentachlorophenol	R	~~0.28~~	~~U~~	~~0.02~~	~~0.28~~	~~0.56~~	~~ug/L~~
92-87-5	Benzidine		0.06	U~~Q~~	0.02	0.06	0.11	ug/L
91-94-1	3,3-Dichlorobenzidine		0.06	U	0.02	0.06	0.11	ug/L
56-55-3	Benzo(a)anthracene		0.06	U	0.02	0.06	0.11	ug/L
218-01-9	Chrysene		0.06	U	0.02	0.06	0.11	ug/L
205-99-2	Benzo(b)fluoranthene		0.06	U	0.02	0.06	0.11	ug/L
207-08-9	Benzo(k)fluoranthene		0.06	U	0.02	0.06	0.11	ug/L
50-32-8	Benzo(a)pyrene		0.06	U	0.02	0.06	0.11	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene		0.06	U	0.02	0.06	0.11	ug/L
53-70-3	Dibenzo(a,h)anthracene		0.06	U	0.02	0.06	0.11	ug/L
SURROGATES								
367-12-4	2-Fluorophenol		2		10 - 160		13%	SPK: 15
13127-88-3	Phenol-d6		1.1	*	10 - 160		7%	SPK: 15
4165-60-0	Nitrobenzene-d5		3.4		20 - 139		33%	SPK: 10
321-60-8	2-Fluorobiphenyl		4.8		10 - 173		48%	SPK: 10
118-79-6	2,4,6-Tribromophenol		6.5		10 - 169		43%	SPK: 15
1718-51-0	Terphenyl-d14		5.9		20 - 171		59%	SPK: 10
INTERNAL STANDARDS								
3855-82-1	1,4-Dichlorobenzene-d4		96801	5.4				
1146-65-2	Naphthalene-d8		370402	7.8				
15067-26-2	Acenaphthene-d10		197464	11.5				
1517-22-2	Phenanthrene-d10		358162	14.73				

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	900 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084755.D	1	02/07/14	02/10/14	PB74946

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	401011	20.49				
1520-96-3	Perylene-d12	374343	23.36				

U = Not Detected
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LOD = Limit of Detection
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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8081B	% Moisture:	100 Decanted:
Sample Wt/Vol:	970 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PD020724.D	1	02/07/14	02/07/14	PB74944

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.005	0.01	0.052	ug/L
319-85-7	beta-BHC	0.01	U	0.009	0.01	0.052	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.006	0.01	0.052	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.01	0.052	ug/L
309-00-2	Aldrin	0.01	U	0.006	0.01	0.052	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.007	0.01	0.052	ug/L
959-98-8	Endosulfan I	0.01	U	0.006	0.01	0.052	ug/L
60-57-1	Dieldrin	0.01	U	0.005	0.01	0.052	ug/L
72-55-9	4,4-DDE	0.01	U	0.005	0.01	0.052	ug/L
72-20-8	Endrin	0.01	U	0.006	0.01	0.052	ug/L
33213-65-9	Endosulfan II	0.01	U	0.006	0.01	0.052	ug/L
72-54-8	4,4-DDD	0.01	U	0.007	0.01	0.052	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.006	0.01	0.052	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.01	0.052	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.005	0.01	0.052	ug/L
8001-35-2	Toxaphene	0.103	U	0.103	0.103	0.515	ug/L
57-74-9	Chlordane	0.103	U	0.103	0.103	0.515	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	14.9		10 - 192		74%	SPK: 20
877-09-8	Tetrachloro-m-xylene	19.9		10 - 172		100%	SPK: 20

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	970 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PB009818.D	1	02/07/14	02/10/14	PB74943

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.103	U	0.099	0.103	0.515	ug/L
11104-28-2	Aroclor-1221	0.103	U	0.103	0.103	0.515	ug/L
11141-16-5	Aroclor-1232	0.103	U	0.103	0.103	0.515	ug/L
53469-21-9	Aroclor-1242	0.103	U	0.092	0.103	0.515	ug/L
12672-29-6	Aroclor-1248	0.103	U	0.103	0.103	0.515	ug/L
11097-69-1	Aroclor-1254	0.103	U	0.045	0.103	0.515	ug/L
11096-82-5	Aroclor-1260	0.103	U	0.084	0.103	0.515	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	20.2		35 - 137		101%	SPK: 20
2051-24-3	Decachlorobiphenyl	17		40 - 135		85%	SPK: 20

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S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U	1	4.2	5.0	10	ug/L	02/10/14	02/10/14	SW6010
7440-43-9	Cadmium	1.5	U	1	0.5	1.5	3	ug/L	02/10/14	02/10/14	SW6010
7440-47-3	Chromium	24.4		1	1.1	2.5	5	ug/L	02/10/14	02/10/14	SW6010
7440-50-8	Copper	5	U	1	2	5.0	10	ug/L	02/10/14	02/10/14	SW6010
7439-92-1	Lead	3	U	1	2.6	3.0	6	ug/L	02/10/14	02/10/14	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	02/07/14	02/10/14	SW7470A
7440-02-0	Nickel	17.5	J	1	4.2	10.0	20	ug/L	02/10/14	02/10/14	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	02/10/14	02/10/14	SW6010
7440-22-4	Silver	2.5	UN	1	1.5	2.5	5	ug/L	02/10/14	02/10/14	SW6010
7440-66-6	Zinc	28.3		1	6.5	10.0	20	ug/L	02/10/14	02/10/14	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/06/14 11:00:00
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	EFFLUENT09(020614)	SDG No.:	F1362
Lab Sample ID:	F1362-02	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.003	U	1	0.003	0.003	0.005	mg/L	02/10/14	02/10/14 11:29	9012B
TOC	15.1		1	0.08	0.25	0.5	mg/L	02/10/14	02/10/14 13:38	SM5310B
TSS	4	U	1	4	4	4	mg/L	02/10/14	02/10/14 11:43	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	02/07/14 08:00
Project:	ARC Horseshoe Road	Date Received:	02/07/14
Client Sample ID:	FIELDPH	SDG No.:	F1362
Lab Sample ID:	F1362-03	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Field pH	6.7		1	0	0	0	pH	02/07/14	02/07/14 08:00	SM4500-H B

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. F1598
QUOTE NO.
COC Number 031317

CLIENT INFORMATION (REPORT TO BE SENT TO:)
COMPANY: Creamer Environmental Inc
ADDRESS: 12 old Bridge rd
CITY: Cedar Grove STATE: NJ ZIP: 07009
ATTENTION: 12-2260
PHONE: 201-968-3300 FAX: 201-968-3301

CLIENT PROJECT INFORMATION
PROJECT NAME: ARC Horseshoe RD
PROJECT NO.: 12-2260 LOCATION: Sayerville
PROJECT MANAGER: Gary Kowalski
e-mail: G.Kowalski@Creamerenvironmental.com
PHONE: 201-481-9308 FAX:

CLIENT BILLING INFORMATION
BILL TO: Creamer Environmental PO#:
ADDRESS: 12 old Bridge RD
CITY: Cedar Grove STATE: NJ ZIP: 07009
ATTENTION: 12-2260 PHONE: 201-968-3300

DATA TURNAROUND INFORMATION
FAX: _____ DAYS *
HARD COPY: STANDARD DAYS *
EDD: _____ DAYS *
PREAPPROVED TAT: ☐ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION
☐ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

	CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1 PCB G.1	2 PEST G.1	3 SVOC-MS G.3	4 SVOC-SIM G.3.1	5 TSS	6 VOCMS G.3	7 METALS-KP G.1	8 TOC	9 CYANIDE	PH	COMMENTS
									PRESERVATIVES										
									E	E	E	E	E	A	B	C	D		← Specify Preservatives A-HCl B-HNO_3 C-H_2SO_4 D-NaOH E-ICE F-Other
1.	2	EFFLUENT 10 (031014)	WATER		X	3/10	955	10	X	X	X	X	X	X	X	X	X		
2.																			
3.																			
4.																			
5.																			
6.																			
7.																			
8.																			
9.																			
10.																			

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME: 3/10 1305	RECEIVED BY: 1.
RELINQUISHED BY: 2.	DATE/TIME:	RECEIVED BY: 2.
RELINQUISHED BY: 3.	DATE/TIME: 3-10-14 1345	RECEIVED FOR LAB BY: 3. CW

Conditions of bottles or coolers at receipt: ☒ Compliant ☐ Non Compliant
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Cooler Temp. 6°C
Ice in Cooler?: ✓

Page 1 of 2

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☒ PICKED UP ☐ OVERNIGHT.

Shipment Complete: ☒ YES ☐ NO

Revision 8/2007
F1599
WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN013467.D	1		03/12/14	VN031114

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
74-87-3	Chloromethane	0.2	U	0.2	0.2	1	ug/L
75-01-4	Vinyl Chloride	0.2	U	0.2	0.2	1	ug/L
74-83-9	Bromomethane	0.2	U	0.2	0.2	1	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	1	ug/L
75-35-4	1,1-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
107-02-8	Acrolein	3.8	U	0.5	3.8	5	ug/L
107-13-1	Acrylonitrile	1	U	1	1	5	ug/L
75-09-2	Methylene Chloride	0.2	U	0.2	0.2	1	ug/L
156-60-5	trans-1,2-Dichloroethene	0.2	U	0.2	0.2	1	ug/L
75-34-3	1,1-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
56-23-5	Carbon Tetrachloride	0.2	U	0.2	0.2	1	ug/L
67-66-3	Chloroform	0.2	U	0.2	0.2	1	ug/L
71-55-6	1,1,1-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
71-43-2	Benzene	0.2	U	0.2	0.2	1	ug/L
107-06-2	1,2-Dichloroethane	0.2	U	0.2	0.2	1	ug/L
79-01-6	Trichloroethene	0.2	U	0.2	0.2	1	ug/L
78-87-5	1,2-Dichloropropane	0.2	U	0.2	0.2	1	ug/L
75-27-4	Bromodichloromethane	0.2	U	0.2	0.2	1	ug/L
108-88-3	Toluene	0.2	U	0.2	0.2	1	ug/L
10061-02-6	t-1,3-Dichloropropene	0.2	U	0.2	0.2	1	ug/L
79-00-5	1,1,2-Trichloroethane	0.2	U	0.2	0.2	1	ug/L
124-48-1	Dibromochloromethane	0.2	U	0.2	0.2	1	ug/L
127-18-4	Tetrachloroethene	0.2	U	0.2	0.2	1	ug/L
108-90-7	Chlorobenzene	0.2	U	0.2	0.2	1	ug/L
100-41-4	Ethyl Benzene	0.2	U	0.2	0.2	1	ug/L
75-25-2	Bromoform	0.2	U	0.2	0.2	1	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U	0.2	0.2	1	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	48.6		61 - 141		97%	SPK: 50
1868-53-7	Dibromofluoromethane	47.2		69 - 133		94%	SPK: 50
2037-26-5	Toluene-d8	47.9		65 - 126		96%	SPK: 50

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group3
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN013467.D	1		03/12/14	VN031114

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
460-00-4	4-Bromofluorobenzene	46.1		58 - 135		92%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	276997	7.87				
540-36-3	1,4-Difluorobenzene	414874	8.79				
3114-55-4	Chlorobenzene-d5	392256	11.61				
3855-82-1	1,4-Dichlorobenzene-d4	179554	13.56				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF069146.D	1	03/11/14	03/11/14	PB75370

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.55	1	10.2	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.27	1	10.2	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10.2	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10.2	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10.2	ug/L
67-72-1	Hexachloroethane	1	U	0.26	1	10.2	ug/L
78-59-1	Isophorone	1	U	0.31	1	10.2	ug/L
88-75-5	2-Nitrophenol	1	U	0.53	1	10.2	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10.2	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10.2	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.57	1	10.2	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10.2	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.33	1	10.2	ug/L
100-02-7	4-Nitrophenol	5.1	U	2	5.1	10.2	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10.2	ug/L
84-66-2	Diethylphthalate	1	U	0.39	1	10.2	ug/L
86-73-7	Fluorene	1	U	0.32	1	10.2	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.76	2	10.2	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.61	1	10.2	ug/L
85-01-8	Phenanthrene	1	U	0.27	1	10.2	ug/L
120-12-7	Anthracene	1	U	0.16	1	10.2	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10.2	ug/L
206-44-0	Fluoranthene	1	U	0.41	1	10.2	ug/L
129-00-0	Pyrene	1	U	0.2	1	10.2	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10.2	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10.2	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	49		10 - 130		33%	SPK: 150
13127-88-3	Phenol-d6	28.7		10 - 130		19%	SPK: 150
4165-60-0	Nitrobenzene-d5	67.2		36 - 131		67%	SPK: 100
321-60-8	2-Fluorobiphenyl	99.5		39 - 131		100%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF069146.D	1	03/11/14	03/11/14	PB75370

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	120		25 - 155		79%	SPK: 150
1718-51-0	Terphenyl-d14	99.2		23 - 130		99%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	71813	6.84				
1146-65-2	Naphthalene-d8	293610	8.42				
15067-26-2	Acenaphthene-d10	125107	10.57				
1517-22-2	Phenanthrene-d10	242483	12.37				
1719-03-5	Chrysene-d12	219131	15.61				
1520-96-3	Perylene-d12	59866	17.22				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
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B = Analyte Found in Associated Method Blank
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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)RE	SDG No.:	F1599
Lab Sample ID:	F1599-02RE	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF069167.D	1	03/11/14	03/12/14	PB75370

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
95-57-8	2-Chlorophenol	1	U	0.55	1	10.2	ug/L
95-50-1	1,2-Dichlorobenzene	1	U	0.27	1	10.2	ug/L
541-73-1	1,3-Dichlorobenzene	1	U	0.13	1	10.2	ug/L
106-46-7	1,4-Dichlorobenzene	1	U	0.2	1	10.2	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10.2	ug/L
67-72-1	Hexachloroethane	1	U	0.26	1	10.2	ug/L
78-59-1	Isophorone	1	U	0.31	1	10.2	ug/L
88-75-5	2-Nitrophenol	1	U	0.53	1	10.2	ug/L
120-82-1	1,2,4-Trichlorobenzene	1	U	0.15	1	10.2	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10.2	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.57	1	10.2	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10.2	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.33	1	10.2	ug/L
100-02-7	4-Nitrophenol	5.1	U	2	5.1	10.2	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10.2	ug/L
84-66-2	Diethylphthalate	1	U	0.39	1	10.2	ug/L
86-73-7	Fluorene	1	U	0.32	1	10.2	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.76	2	10.2	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.61	1	10.2	ug/L
85-01-8	Phenanthrene	1	U	0.27	1	10.2	ug/L
120-12-7	Anthracene	1	U	0.16	1	10.2	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10.2	ug/L
206-44-0	Fluoranthene	1	U	0.41	1	10.2	ug/L
129-00-0	Pyrene	1	U	0.2	1	10.2	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10.2	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10.2	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	50.9		10 - 130		34%	SPK: 150
13127-88-3	Phenol-d6	31.6		10 - 130		21%	SPK: 150
4165-60-0	Nitrobenzene-d5	70.8		36 - 131		71%	SPK: 100
321-60-8	2-Fluorobiphenyl	100		39 - 131		101%	SPK: 100

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)RE	SDG No.:	F1599
Lab Sample ID:	F1599-02RE	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOCMS Group3
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF069167.D	1	03/11/14	03/12/14	PB75370

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
118-79-6	2,4,6-Tribromophenol	120		25 - 155		80%	SPK: 150
1718-51-0	Terphenyl-d14	99.4		23 - 130		99%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	88265	6.83				
1146-65-2	Naphthalene-d8	361295	8.41				
15067-26-2	Acenaphthene-d10	147045	10.56				
1517-22-2	Phenanthrene-d10	289657	12.37				
1719-03-5	Chrysene-d12	266225	15.61				
1520-96-3	Perylene-d12	31385	17.23				

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N = Presumptive Evidence of a Compound
* = Values outside of QC limits
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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084863.D	1	03/11/14	03/11/14	PB75369

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
62-75-9	n-Nitrosodimethylamine	0.05	U	0.02	0.05	0.1	ug/L
108-95-2	Phenol	0.05	U	0.02	0.05	0.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	0.05	U	0.02	0.05	0.1	ug/L
98-95-3	Nitrobenzene	0.05	U	0.02	0.05	0.1	ug/L
105-67-9	2,4-Dimethylphenol	0.05	U	0.02	0.05	0.1	ug/L
120-83-2	2,4-Dichlorophenol	0.05	U	0.02	0.05	0.1	ug/L
87-68-3	Hexachlorobutadiene	0.05	U	0.02	0.05	0.1	ug/L
51-28-5	2,4-Dinitrophenol	1.3	UQ J	0.02	1.3	2.6	ug/L
118-74-1	Hexachlorobenzene	0.05	U	0.02	0.05	0.1	ug/L
87-86-5	Pentachlorophenol	0.26	U	0.02	0.26	0.52	ug/L
92-87-5	Benzidine	0.05	U	0.02	0.05	0.1	ug/L
91-94-1	3,3-Dichlorobenzidine	0.05	U	0.02	0.05	0.1	ug/L
56-55-3	Benzo(a)anthracene	0.05	U	0.02	0.05	0.1	ug/L
218-01-9	Chrysene	0.05	U	0.02	0.05	0.1	ug/L
205-99-2	Benzo(b)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
207-08-9	Benzo(k)fluoranthene	0.05	U	0.02	0.05	0.1	ug/L
50-32-8	Benzo(a)pyrene	0.05	U	0.02	0.05	0.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	0.05	U	0.02	0.05	0.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	7.1		10 - 160		47%	SPK: 15
13127-88-3	Phenol-d6	4.6		10 - 160		30%	SPK: 15
4165-60-0	Nitrobenzene-d5	7.4		20 - 139		74%	SPK: 10
321-60-8	2-Fluorobiphenyl	7.6		10 - 173		76%	SPK: 10
118-79-6	2,4,6-Tribromophenol	10.7		10 - 169		71%	SPK: 15
1718-51-0	Terphenyl-d14	10.2		20 - 171		101%	SPK: 10
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	278122	4.95				
1146-65-2	Naphthalene-d8	1129560	7.31				
15067-26-2	Acenaphthene-d10	562429	10.96				
1517-22-2	Phenanthrene-d10	877700	14.16				

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-SIMGroup1
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE084863.D	1	03/11/14	03/11/14	PB75369

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
1719-03-5	Chrysene-d12	841216	19.9				
1520-96-3	Perylene-d12	805987	22.75				

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* = Values outside of QC limits
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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PESTICIDE Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PD021069.D	1	03/11/14	03/13/14	PB75368

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.005	0.01	0.05	ug/L
319-85-7	beta-BHC	0.01	U	0.009	0.01	0.05	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.006	0.01	0.05	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.01	0.05	ug/L
309-00-2	Aldrin	0.01	U	0.006	0.01	0.05	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.007	0.01	0.05	ug/L
959-98-8	Endosulfan I	0.01	U	0.006	0.01	0.05	ug/L
60-57-1	Dieldrin	0.01	U	0.005	0.01	0.05	ug/L
72-55-9	4,4-DDE	0.01	U	0.005	0.01	0.05	ug/L
72-20-8	Endrin	0.01	U	0.006	0.01	0.05	ug/L
33213-65-9	Endosulfan II	0.01	U	0.006	0.01	0.05	ug/L
72-54-8	4,4-DDD	0.01	U	0.007	0.01	0.05	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.006	0.01	0.05	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.01	0.05	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.005	0.01	0.05	ug/L
8001-35-2	Toxaphene	0.1	U	0.1	0.1	0.5	ug/L
57-74-9	Chlordane	0.1	U	0.1	0.1	0.5	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	18.6		10 - 192		93%	SPK: 20
877-09-8	Tetrachloro-m-xylene	19.4		10 - 172		97%	SPK: 20

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LOD = Limit of Detection
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P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
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* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB Group1
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO012862.D	1	03/11/14	03/12/14	PB75367

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.1	U	0.096	0.1	0.5	ug/L
11104-28-2	Aroclor-1221	0.1	U	0.1	0.1	0.5	ug/L
11141-16-5	Aroclor-1232	0.1	U	0.1	0.1	0.5	ug/L
53469-21-9	Aroclor-1242	0.1	U	0.089	0.1	0.5	ug/L
12672-29-6	Aroclor-1248	0.1	U	0.1	0.1	0.5	ug/L
11097-69-1	Aroclor-1254	0.1	U	0.044	0.1	0.5	ug/L
11096-82-5	Aroclor-1260	0.1	U	0.081	0.1	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18.8		35 - 137		94%	SPK: 20
2051-24-3	Decachlorobiphenyl	14.4		40 - 135		72%	SPK: 20

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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	5	U~~N~~	1	4.2	5.0	10	ug/L	03/11/14	03/11/14	SW6010
7440-43-9	Cadmium	1.5	U	1	0.5	1.5	3	ug/L	03/11/14	03/11/14	SW6010
7440-47-3	Chromium	19	~~N~~	1	1.1	2.5	5	ug/L	03/11/14	03/11/14	SW6010
7440-50-8	Copper	3.82	J	1	2	5.0	10	ug/L	03/11/14	03/11/14	SW6010
7439-92-1	Lead	3	U~~N~~	1	2.6	3.0	6	ug/L	03/11/14	03/11/14	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	03/10/14	03/11/14	SW7470A
7440-02-0	Nickel	11.8	J~~N~~	1	4.2	10.0	20	ug/L	03/11/14	03/11/14	SW6010
7782-49-2	Selenium	5	U~~N~~	1	4.8	5.0	10	ug/L	03/11/14	03/11/14	SW6010
7440-22-4	Silver	2.5	U	1	1.5	2.5	5	ug/L	03/11/14	03/11/14	SW6010
7440-66-6	Zinc	43.8		1	6.5	10.0	20	ug/L	03/11/14	03/11/14	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	Metals Group1				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14 09:55:00
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	EFFLUENT10(031014)	SDG No.:	F1599
Lab Sample ID:	F1599-02	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.005		1	0.003	0.003	0.005	mg/L	03/10/14	03/11/14 12:20	9012B
TOC	9.12		1	0.08	0.25	0.5	mg/L	03/10/14	03/10/14 17:34	SM5310B
TSS	10.8		1	4	4	4	mg/L	03/11/14	03/11/14 11:43	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	Creamer Environmental, Inc.	Date Collected:	03/10/14 13:15
Project:	ARC Horseshoe Road	Date Received:	03/10/14
Client Sample ID:	FIELDPH	SDG No.:	F1599
Lab Sample ID:	F1599-03	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Field pH	7.72		1	0	0	0	pH	03/10/14	03/10/14 13:15	SM4500-H B

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits